ETHNOLOGY OF MANIHIKI AND RAKAHANGA

BY
TE RANGI HIROA
(P. H. BUCK)

BERNICE P. BISHOP MUSEUM
BULLETIN 99

HONOLULU, HAWAII
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INTRODUCTION

Acknowledgments

This study of the culture of Manihiki and Rakahanga represents part of the material gathered on the Cook Islands Expedition of Bernice P. Bishop Museum in 1929.

I landed in Manihiki on May 31 on the schooner *Tiare Taporo* under Captain Viggo. While I was in Rakahanga, Judge Hugh Ayson, Resident Commissioner for the Cook Islands, convened the Native Land Court to inquire into family pedigrees for the purpose of forming bases for land claims. Through his courtesy and the assistance of Stephen Savage, Registrar of the Court, I was able to acquire a complete set of island pedigrees. To Henry Williams, Jr., I am under obligation not only for maps of Manihiki and Rakahanga, but also for assistance in recording anthropometrical measurements. To Tupou-rahi, Sergeant of Police at Rakahanga, and his family thanks are due for accommodation, hospitality, and much information. The hospitality of the kindly people of Rakahanga manifested itself in feasts and presents of artifacts. The people were eager to impart what they knew, but owing to the exigencies of inter-island transport three weeks were all that could be devoted to the atoll. Only two nights were spent in Manihiki before the schooner moved on to Tongareva. In Manihiki the people of the villages, Tauhunu and Tukou, were also most hospitable and would not let their visitors go without weighing them down with food and presents. The gratitude of Bernice P. Bishop Museum is due to the people of the two atolls whose gifts have materially enriched the Polynesian collection. I have also to thank Mr. Murray of Rakahanga for the replica of a club and Henry Williams, Sr., and his family for hospitality and assistance.

The time spent in the two atolls was all too short to do justice even to the abridged field information available. This study can only hope to record some of the main points in the culture of the people. Details as to spread of the coconut and the ownership of land await the further investigator of land claims, when more information is available.

Meanwhile, the Huru-awatea waves its fronds in the shade of Arai-awa—"Tera pa te Huru-awatea te tahirihiri mai ra i te maru o Arai-awa."

Culture

Manihiki and Rakahanga, atolls 25 miles apart, are occupied by a people sprung from one family of settlers. The whole population once lived on one atoll at a time and moved back and forth from one atoll to the other when forced to do so by depletions of the coconut and *puraka* (species of taro) supplies. Manihiki and Rakahanga are so low that one atoll cannot be seen from the other, but from a point halfway between them both are visible. The people, in going from one atoll to the other, used the Magellan clouds (*Na Mahu*) as guides. The voyages were made in fleets of double sailing canoes, and the *Whakaheo ariki* (p. 52), because he was believed to control the weather conditions that insured a successful voyage, took command. Now and again the voyagers were unexpectedly overtaken by storms, but such disasters did not deter the people from making their inter-atoll voyages, for they were impelled by an important need, the urge for food. The occasional loss of life was regarded merely as the natural toll of the sea which the ancestors had paid from time immemorial. It remained for outside influence, in 1852, to use the loss of life as a means of dividing the population into permanent settlements on each atoll. Thus, though Manihiki and Rakahanga are two atolls, the culture is one. References in this text to the culture of either atoll may be taken to apply to the culture of both areas.

Geography

Manihiki and Rakahanga are atolls now politically included in Cook Islands, but, together with Tongareva (Penrhyn), Pukupuka, Nassau, Suvarov (Suwarrow), and Palmerston, they are not geographically part of Cook Islands. References in the text to Cook Islands apply to the geographical division unless it is otherwise stated. Manihiki lies 650 miles north of Rarotonga. Rakahanga is 25 miles north northwest of Manihiki. The two atolls are south of latitude 10° S. and west of longitude 160° W. (See fig. 1.)

Manihiki is the larger of the two atolls and contains about 1,250 acres of land. It has a fine lagoon abounding in pearl shell and *Tridacna,* but there are no large natural passages through the reef. The boat passages opposite the two villages are short and boats or canoes must be run up onto the reef, from which they are dragged to the deeper water on the inner side of the reef flat. Shallow passages through which the tide reaches the central lagoon separate the islands. (See fig. 2.)

Many of the islands shown in figure 2 are named in pairs with the qualifying terms *rahi* (large) and *iti* (small), as in Hohahake rahi and Hohahake iti. Some receive the name *motu* (island) with a qualifying term, as in Motu-roa (Long Island), Motu Fara (*Pandanus* Island), and Motu-o-poia (Poia's Island). The large island, Porea, has a fishpond in its interior.

Brigham (3, p. 106)[1] has given the atoll the incorrect name, Monahiki, and in writing of model double canoes inlaid with pearl shell he has evidently confused the correct name, Manihiki, with Manihi in the Tuamotus.

Rakahanga, with an area of 1,000 acres, is smaller than Manihiki. It is written "Rakaanga" on the maps, from a failure to appreciate the presence of the *h* sound. Gill, who did not visit the atoll, makes the curious statement that there is no lagoon (11, p. 12). Brigham (3, p. 35) has evidently copied the erroneous statement. Rakahanga is an atoll, and the inclosed lagoon is a characteristic feature. (See fig. 3.)

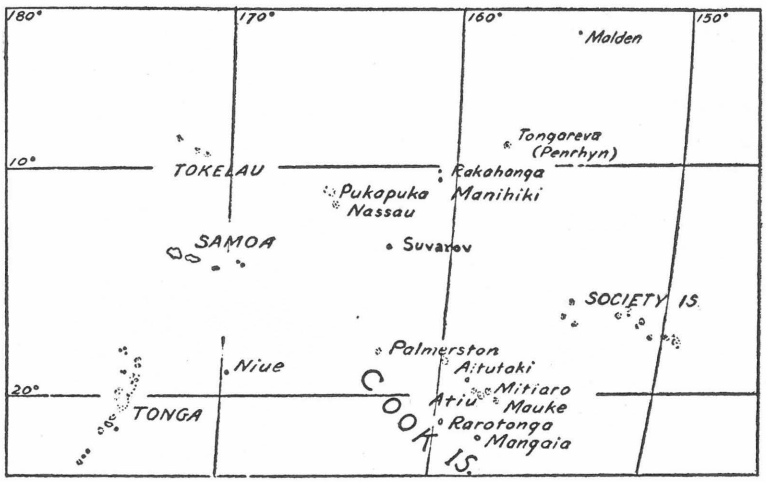


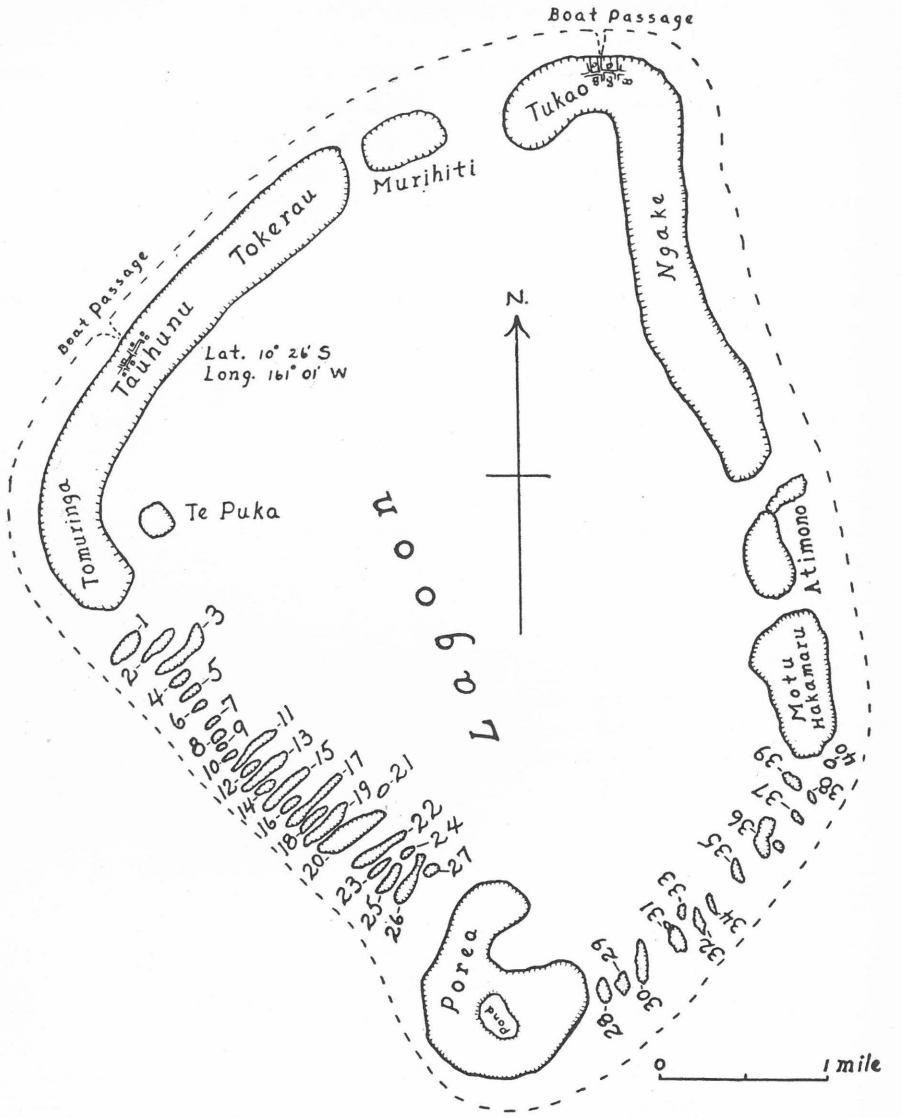
FIGURE 1. Map of part of the central Pacific Ocean showing the position of Manihiki and Rakahanga.

The small island, Te Kainga, in the southwest, was the original home of the people, but the site of the single village was changed to Rakahanga across the inter-island channel to the south. Opposite Te Kainga is the shallow boat passage. The reef has no deep passages. The presence of the place names Tongareva and Tua-i-Omoka on the south coast suggests some connection with the Tongarevan atoll, in which Omoka is the principal village. The historical connection is further supported by the name Tua i te Ara o Mahuta (the back of the path of Mahuta) on the northeast. Mahuta, the Tongarevan ancestor, is stated by both Tongarevan and Rakahangan traditions to have lived in Rakahanga prior to his voyage to Tongareva.

CONTACT WITH WESTERN CULTURE

Bellinghausen, the Russian explorer, visited Rakahanga in 1820 and named it Grand Duke Alexander. In 1822 Captain Patrickson in the *Good*

[1] Numbers in parentheses refer to Literature Cited, page 232.



MANIHIKI ISLETS

1. Rangahoe
2. Name unknown (not recorded)
3. Hohahake-rahi
4. Hohahake-iti
5. Te Motu-o-Poia
6. Tima
7. Tapa
8. Paeke-rahi
9. Paeke-iti
10. Hiropotiki
11. Tikapai
12. Name unknown
13. Moturoa
14. Mairere-tou
15. Motu-fara [Motu-whara]
16. Te Motu-o-Pae
17. Fakifaki [Whakiwhaki]
18. Taingaru-iti
19. Taingaru-rahi
20. Topuaikaha
21. Name unknown
22. Raukotaha
23. Rifa-iti [Riwha-iti]
24. Toruerue-iti
25. Toruerue-rahi
26. Punganui-rahi
27. Punganui-iti
28. Name unknown
29. Nafarakura [Nawharakura]
30. Tavahavaha
31. Tarakite-rahi
32. Kopu-ngaha
33. Tarakite-iti
34. Hakari-manu
35. Motu-tou
36. Toputangaroa
37. Aratini
38. Nuku-Hiro
39. Iotia
40. Moina

FIGURE 2. Map of Manihiki showing villages Tauhunu and Tukou. (Based on a sketch by Henry Williams, Government Surveyor, Cook Islands.) The spelling "Tukao" on the map should be "Tukou."

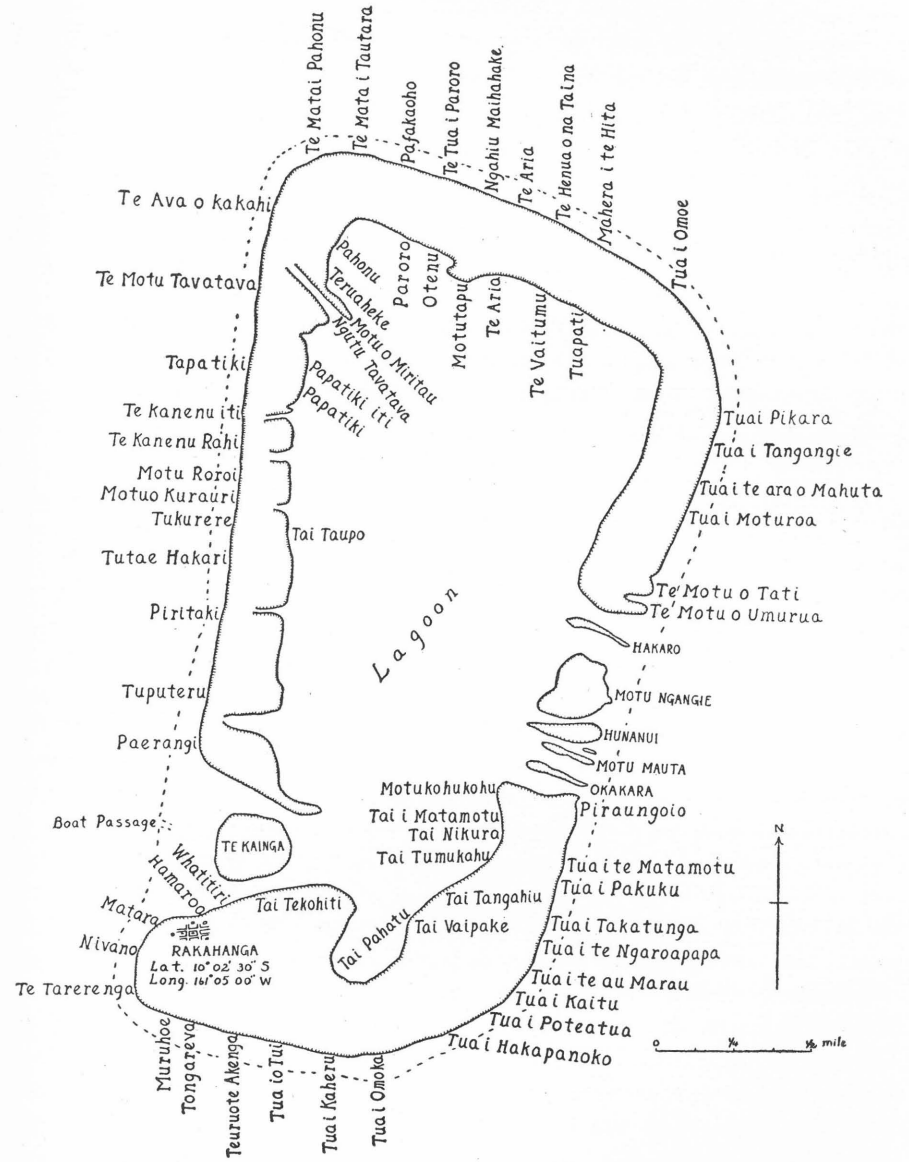


FIGURE 3. Map of Rakahanga, much of the land area shown without the shallow channels which divide the small islands. (Based on an uncompleted survey by Henry Williams, Government Surveyor, Cook Islands.)

Hope saw both atolls. He gave Rakahanga the name Reirson and called Manihiki Humphrey.

According to Gill (10, vol. 2, p. 266), the first person to tell the islanders of the "white man's God" was a Tahitian lad who ran away from a whaling ship that called at Manihiki to get a supply of coconuts. Some of the young men of Manihiki set out in a canoe expedition in the hope of getting to some of the islands of which they were told. "In this and other enterprises of kindred character," writes Gill, "many of them lost their lives, and on one occasion some were taken to the distant islands of Samoa."

The first actual contact with Western culture was brought about by an accident which befell a party sailing from Manihiki to Rakahanga in 1849. A canoe was blown out of its course and was picked up by a whaling ship 80 miles from land. The whaler picked up the crew of five men and four women. Gill (10, vol. 2, p. 268) states that the captain intended to land the Manihikians at Aitutaki or Rarotonga, but that, not being able to make either island, he landed them at Manuae, where an American salesman was living, collecting coconuts, and feeding swine for the Tahitian market. The missionary ship *John Williams* eventually called at Manuae and took the Manihikians to Aitutaki, which had come under Christian influence in 1821. After a fortnight on Aitutaki they were returned to Manihiki on the mission ship, accompanied by two native teachers named Aporo and Tahiri. The people allowed the teachers to land, and the London Missionary Society thus established itself on Manihiki.

The teachings of the missionaries were accepted; in less than twelve months after the missionaries landed, most of the material representations of the native gods were destroyed. Churches and schools were established, and the foundations of Western culture were laid by the native teachers. Gill, on a voyage to Sydney in the mission ship, visited Manihiki in 1852. He remarks (10, vol. 2, p. 276) that in the space of three years all the inhabitants, with the exception of one hundred persons, were under Christian instruction. After the establishment of the teachers, twenty persons out of two hundred who were overtaken by a storm were drowned in a voyage to Rakahanga. As a result of missionary representations in 1852, the Christians in Sydney purchased a boat for the teachers, and the Aitutakians purchased another. With the introduction of European boats commenced the passing away of the old-time double sailing canoes in which the voyages between the two atolls had been made. Gill and the native teachers also used their influence in persuading the people to abandon the voyages between the two atolls. To prevent the necessity for the voyages, the population was divided, and each atoll was occupied permanently. The religious influence of the introduced culture resulted in the destruction of the maraes and of

the native gods and in the loss of the priestly functions of the two *ariki* known as the *Whainga-aitu* and the *Whakaheo* (p. 48). Houses and clothing were affected by the introduction of new modes and materials. The abandonment of the inter-atoll voyages with permanent occupation of the two atolls by the divided people led to further changes in social organization in which the power of the high chiefs lessened as the influence of the missionaries increased. One of the *Whakaheo* even offered the succession of the title to the missionary teacher, Tahiri. Tahiri refused the title but later used his influence to have succession conferred on the female line, as his selected candidate was a deacon in the church (p. 54).

The missionary teachers, following the procedure adopted by the London Missionary Society in Aitutaki, Rarotonga, and Mangaia, formulated a number of moral laws, the infringing of many of which we would regard as "sins" to be dealt with by moral teaching or church discipline. The chiefs, however, who had become deacons of the church, could not let such offences go without inflicting material punishment. A list of fines to be paid in money and trade was instituted. Some elements of the Western culture of the early white missionaries were evidently adopted, for accused persons were put in the stocks to await trial, and women found guilty of sex offences were drummed through the village after they had been fined. If an offender was caught on a Saturday evening, he or she remained in the stocks all day Sunday, for the Sabbath could not be desecrated by the holding of a court on that day. The administration of the laws was in the hands of people termed Turimen who were elected annually by the heads of households. A Turiman held the double office of police and judge. In Manihiki, Turimen were divided into four vigilance committees which took alternate weeks of duty. An offender was reported by a Turiman to his committee, and the committee promptly exacted the fine laid down for the offence. There was no formal trial and the accused had no appeal. Half of the fines went to the *ariki,* and the other half was divided among the Turimen. The system led to espionage of sexual behavior in order that the amount of fines might be increased as much as possible, and a mean spirit foreign to Polynesian psychology was engendered. However, in the curious adjustment that took place was the retention of a Polynesian trait, inasmuch as the relatives of the offender shared his burden by assisting him to pay the fine in order to save the family name.

Moss (20, pp. 117, 118) sums up the situation as follows:

> The laws are objectionable, and their modes of enforcing them, putting men and women in the public stocks or drumming them through the public street, are bad enough; but the methods of prevention and discovery which these Turimen adopt, are worse. If a Turiman suspects a man of having taken liquor, he will stop him at any time and order him to "blow" so that he may discover if his breath has lost its normal sweetness.

The decision then come to is conclusive, adopted as a judgment by his fellow Turimen and the culprit fined accordingly. A "curfew" drum is beat at eight o'clock, and after that hour if anyone is seen abroad the Turimen are down upon him with a heavy fine next day. Their lovely moonlight nights bring no enjoyment to these people.

Henry Williams, Sr., informed me that three Peruvian slavers visited the atolls, but as one ship came within an ace of being wrecked by drifting onto the reef, the slavers withdrew without effecting depredations as they did in Tongareva.

The notorious Captain Bully Hayes in the brig *Rona* foundered at sea near Manihiki, according to Moss (20, p. 86). Captain Hayes was kindly treated by the Manihikians, who helped him to build another small craft. The vessel completed, he started with a party of Manihikians for a marriage feast at Rakahanga. He purposely missed Rakahanga, however, and made Samoa. He induced the Manihikians to work on one of the plantations and charged their employer a good round sum for bringing laborers to Samoa.

In marked contrast to scoundrels of the Hayes type were men of the stamp of Henry Greig and George Ellis. Greig employed Manihikian labor on Fanning Island. He married a Manihikian woman of high rank, and his descendants on Manihiki are respected people. George Ellis was a trader on Manihiki and taught the people much in the way of useful crafts. His two sons, Ben and Dan, are leaders in the atoll.

A certain amount of friction existed at one time between the supporters of the native missionary and a faction opposed to him. The French at Tahiti were invited to annex the atolls, but when the French warship appeared for this purpose the native missionary hauled up the British flag and dared anyone to lower it. The crisis passed, and French annexation did not materialize.

In the copra and pearl shell trade which developed, trading firms established touch with Manihiki and Rakahanga from Rarotonga. Thus for both religious and commercial purposes the atolls were connected with Rarotonga. As the result of a petition in 1900 by the *ariki* of the Cook Islands, Manihiki and Rakahanga were included in the boundaries of New Zealand by an Imperial Order in Council in 1901. The atolls are governed by New Zealand through the Resident Commissioner at Rarotonga. Henry Williams, Sr., who is of part-Manihikian blood, is Government Agent for the two atolls. He is assisted in each atoll by a council of eight nominated persons. The villages in the two atolls are models of orderly arrangement and cleanliness and are not surpassed in any of the Cook Islands.

The People

The population given in the last five government censuses is as follows:

	1906	1911	1916	1921	1926 Males	1926 Females	1926 Whites	1926 Total
Manihiki	521	444	493	432	214	199	3	416
Rakahanga	352	315	295	310	172	153	2	327

Although during the 20 years from 1906 to 1926 the total population of the administrative territory of the Cook Islands has shown an increase, the population of Manihiki has decreased by 115 and that of Rakahanga by 25. Part of the decrease has been due to emigration to Rarotonga, where the better opportunities of obtaining employment have attracted settlers. This emigration has resulted in a Manihikian colony in Rarotonga.

The Language

The language is a pleasing dialect and has closer affinities with Maori than with the dialects of Tongareva, Tahiti, and the Cook Islands. The dialect differs from Tongarevan in using *h* instead of *s* and *wh* instead of *h*, from Tahitian in retaining *k* and *ng* and using *wh* instead of *f*, and from Cook Islands dialects in the presence of *wh* and a more definitely sounded *h*. All these differences are shared by the Maori dialect. Also, a number of words that are not shared by the Rarotongan and Tahitian dialects are common to the Maori and the Manihiki-Rakahangan dialects.

The native pastors, educated by the London Missionary Society in Rarotonga, have introduced the alphabet adopted for Rarotonga. This alphabet is without the letter *h*, and *v* is used instead of *w*. Thus both the *h* and *wh* sounds which are present in the dialect have no letters to represent them. No organized effort has been made by the church or the state to remedy the deficiencies. As in others of the Cook Islands, the local dialect is being assimilated rapidly by the Rarotongan dialect. The Bible, which is printed in Rarotongan, exercises a great influence in standardizing Rarotongan as the accepted dialect.

The alphabet in use contains the vowels *a, e, i, o,* and *u*, and the consonants *k, m, n, ng, p, r, t,* and *v*.

The consonants not represented are *h* and *wh,* and the *v* should be *w*. Stephen Savage, official interpreter to the Cook Islands Administration, holds that *w* should have been adopted for the Rarotongan dialect instead of *v*. This applies with even more force to Manihikian. At the same time, there may be some such words as *vero* (stern piece of a canoe) that are pronounced with a *v* sound. The older people pronounce the words with a *w* and write them with a *v*. With the modern method of teaching by alpha-

betical sounds, the tendency is for the younger people to adopt the *v* sound as taught to them. Europeans have recorded the *h* sound in Manihiki on official maps and have omitted the equally obvious *h* sound in Rakahanga by printing it "Rakaanga." The people pronounce the name of their atoll "Manihiki" and write it "Maniiki" because the schools do not include the *h* when teaching the alphabet. An extra emission of the breath gives *h* the sound *hi* before the regular vowel, and it has become usage to say "hi," as in "Hiuku," for Huku, a word variously written as "Iku," "Hiku," and "Huku." Smith, in editing Gill's account of the origin of Manihiki (13, p. 140), states that the name should be spelled " Hiku"; but though this represents the name as it would appear in other dialects, the local pronunciation is "Hiuku." The people, not having been provided with the letter *h* by the teachers of the Rarotongan alphabet, usually spelled it "Uku," or even "Iuku." It is, perhaps, more convenient to spell it "Huku," but the correct pronunciation must be borne in mind (see page 14). This usage resembles that of the Rarawa tribe of the Maoris of northern Auckland, who have a tendency to use *he,* as in "Heone" for Hone, a pronunciation used by older people but not followed by the younger generation of Maoris.

The *wh* sound has been recorded for New Zealand and the Chatham Islands by the double letter *wh*. Of this consonant Williams says (31, p. 568):

> *Wh* represents the voiceless consonant corresponding with *w,* and is produced by emitting the breath sharply between the lips. It is a mistake to assimilate the sound to that of *f* in English, though it has become fashionable in recent years with some of the younger Maoris. In some words *wh* and *h* are interchangeable, as *kohatu, kowhatu; mahiti, mawhiti.* In a few words there is confusion between *wh* and *w,* but this may be due to the fact that in early works printed in Maori no distinction was made between the two, both being printed as *w*. *Wh* is never found in Maori followed by *o* or *u*.

It was evident to both natives and Europeans that an extra sound not provided for by the Rarotongan alphabet was present. The mistake of assimilating the sound to that of *f* in English was committed by Europeans, and the few natives who write have followed suit. Thus we have the word for hala (*Pandanus*) written as "fara" and it appears in figure 2 as Motu Fara (*Pandanus* Island). A certain amount of influence may have come from Tahiti, where the sound exists as an actual *f,* and the word is pronounced "fara." Knowing this, I was prepared to accept the sound as *f* until I heard the words pronounced in the atolls. While I was recording pedigrees in the Land Court at Rakahanga it became evident to me that the sound was not the English or Tahitian *f* but resembled the Maori *wh*. However, lest my own Maori background might have influenced me, I asked Stephen Savage and Henry Williams, Jr., who is of Manihikian extraction,

to check up on the words containing the sound. They agreed that the sound was *wh* and not *f*.

The remarks of Williams (31) about the confusion between the Maori *wh* and *w* apply with still more force to the Manihikian *wh* and *v*. The *v* is wrong in the first place, but it was the only letter that could be used to represent both the *w* and *wh* sounds, until a few people began to use *f*.

The interchange in some Maori words between *wh* and *h*, noted by Williams, applies also to inter-dialectical variations. Although the distinction between *wh* and *f* is marked as regards sound and the position of the lips and teeth, the fashionable interchange in recent years by the younger Maoris has evidently followed a general Polynesian tendency. K. P. Emory of Bernice P. Bishop Museum informs me that the Tahitian *f* sound prevails over most of the Tuamotuan archipelago, but that at Reao in the east the *wh* sound is used. This was checked by Mr. Emory and F. J. Stimson, both of whom were accustomed to the Tahitian *f*. Interchanges have thus occurred between *h*, *wh*, and *f*. A good test word is the widespread Polynesian name for house, which consists of one of the three interchangeable consonants followed by *are* or *ale*, according to the dialectical selection between *r* and *l*. The main dialects interchange as follows:

Hare	Whare	Fare
Cook Islands	New Zealand	Society Islands
Tongareva	Chatham Islands	Tuamotus
Hawaii (hale)	Manihiki	Marquesas (fa'e)
	Reao (Tuamotus)	Samoa (fale)
		Tonga (fale)

Although *wh* occupies the intermediate position between *h* and *f*, a direct interchange between *h* and *f* is seen in the eastern Polynesian word *aroha* and the western word *alofa*. It is tempting to think of *h* as the simplest, oldest form, retained in the northern remote area, Hawaii, and surviving in Tongareva and Cook Islands; of the *wh* as an old form retained in the southern remote area of New Zealand and Chatham Islands, the remote eastern area of Reao, and surviving in Manihiki; and of the *f* as coming in as a later intrusive element from the west, establishing itself in the Society Islands, when it spread through the Tuamotus and Marquesas, displacing the *wh* but failing to extinguish it in the far east at Reao.

Some inconsistency in the spelling of native words will be observed in this study. In quotations from manuscripts or printed works the original spelling has been kept, but in my own observations the *h* and *wh* have been used in words in which they were sounded. As in Tongareva, a study of the dialect and local vocabulary awaits the linguist.

TRADITIONAL HISTORY

DISCOVERY

The traditional story of the discovery of Rakahanga and Manihiki is a blend of historical narrative and myth. The human discoverer, Huku (see p. 19), is stated to have sailed from Rarotonga on a fishing expedition. When he came to a part of the ocean referred to as "te tukuanga i Whakahotu" he noticed an upgrowth of rock or land (*tapua whenua*) projecting from the sea bottom but not rising above the water, an image evidently culled from the experience of an atoll-dwelling people to whom coral upgrowths on an encircling reef were familiar. Huku, on seeing the coral upgrowth, recited these words (*pehe*), which are always recited by native historians: "Titiro iho Huku, tapua e—" (Huku gazed down, [and saw] an upgrowth.) From this incident Huku named his canoe *Tapua.* Gill's informant (13, p. 140) gave the canoe name as *Tapuaua,* which is really *Tapua-hua* and means "an upgrowth only." Huku returned to his home with the idea that the upgrowth would eventually reach the surface and become land.

Pure myth is introduced by interpolating the island-fishing exploits of the well-known Polynesian hero, Maui. The myth states that Tangaroa-tuhi-mata, with his wife, Hina-mata-porari, dwelt in Hawaiki-ki-raro, which was under the earth's surface. Their son, Tongoi-whare, dwelt with his wife, Makuwai-whare, in Hawaiki-ki-runga, which was on the earth's surface. Tongoi-whare had three sons, Maui-mua, Maui-roto, and Maui-muri, and a daughter named Hina-mai-raro-te-takere. The three brothers planned a fishing expedition and caught some flying fish (*maroro*) for bait. Maui-muri, unknown to his brothers, went to Hina-i-te-papa who dwelt at the bottom of the sea. He told her of the proposed expedition and asked her to put certain fish on the hooks according to the manner in which they were baited. On the first hook let down, baited with flying fish, she was to put a shark (*mango*), and on the second hook, also baited with flying fish, she was to put an *urua.* His own hook was to be baited with a small branch of the *puka* tree (*tauru raupuka*), dried coconut husk (*puakoua*), coconut flower stalk (*puroro*), and a dry, immature young coconut (*aoa*). When she saw it, she was to hook it into the rock bottom of the sea.

The next day the brothers set out in a canoe named *Pipi-ma-hakohako.* Tupou-rahi stated that the name of the canoe was *Whakahotu* and quoted the following chant as proof:

Wharekura-ariki i noho ia Hina-i-te-papa,	Wharekura the ariki married Hina-i-te-papa,
Nohona te waka o nga atua;	His was the canoe of the gods;
Whakahotu, nohona te tukunga.	Whakahotu, his was the fishing ground.
To rire to, e tapu.	

Tupou-rahi has evidently associated the name Whakahotu with the canoe, whereas it is really associated with the fishing ground. The historic spot in the ocean visited by Huku was termed "Te tukunga i Whakahotu." The construction of the chant shows that the *tukunga* (fishing ground) was owned by Whakahotu. Although Whakahotu does not appear elsewhere in Rakahangan tradition, in neighboring Tongareva (29) the name appears as Hakahotu. Hakahotu was the wife of Atea, and the two were the primary parents whose progeny were the gods Tangaroa, Tane, Rongo, and others. It may be that Rakahanga had some legend of Whakahotu similar to the Tongarevan story, and that the details have been lost.

Arrived at the fishing ground, Maui-mua (Maui-the-first-born) let down his hook baited with flying fish. When a fish took the hook, he began to chant a question (*tautopa*):

Maui-roto, Maui-muri, e uia mai
Te ingoa i taku ika, mei aha?

Maui the middle, Maui the last, ask
The name of my fish, what is it?

Maui-roto remained silent but Maui-muri, relying on his compact with Hina-i-te-papa, replied:

E haha mango tau ika tutae, hutia!
A large shark is your filthy fish, haul it up!

A shark was duly hauled up. Tupou-rahi said that the fish was an albacore (*kakahi*). Maui-roto let down his hook baited with flying fish, and when he hooked a fish he also chanted a question. Maui-muri named an *urua,* which was duly hauled in. Maui-muri then baited his hook with the leaves and husk according to plan. Hina-i-te-papa, on seeing the hook so baited, stuck it into the *papa* or rock at the bottom of the sea. From what follows, it is to be inferred that the rock was the upgrowth seen by Huku. When Maui-muri felt the hook take hold, he called (*uru*) a question to his elder brothers, who named a shark and an *urua.* Maui-muri thereupon hauled on his line. As the fish rose, the sea began to boil and foam (*kua wheta te moana*), and land appeared (*kua haha te whenua*). The rising land lifted the canoe on its steep edge. Maui-mua and Maui-roto were in the bow and Maui-muri in the stern. The canoe broke in the middle. The bow part with the two elder brothers fell into the seething water, and they were swept away. The stern part remained on the land, and Maui-muri stepped ashore. He then recited a chant (*amu*):

Tataka, tataka e, tataka ki muri,
Tataka, tataka e, tataka ki muri.
Tokomiti, tokomiti,
Tokowheta, tokowheta.
Haha, haha te whenua,
Tutu Maui.

Fall off, fall off, fall off to the stern,
Fall off, fall off, fall off to the stern.
The sea recedes,
The sea seethes.
It appears, the land appears,
And Maui stands upon it.

In the chant recorded by Gill (13, p. 141) the words "Motu Manihiki, motu Rakahanga" (Manihiki is severed, Rakahanga is severed) are added, but they are not severed from each other until the later reappearance of Huku. Maui-muri, having lost his brothers and his canoe, explored the new land. A curious reference is made to his seeing a house of sand (*whare one*). Gill (13, p. 148) states that the house contained eighty spirits. Tupou-rahi stated that Maui saw an opening in the sand and dug down. The hole contained ugly fish from the bottom of the sea (*ko te au ika kikino anake i raro i te moana*). Such details were evidently intended to embellish the tale and perhaps to emphasize the fact that there were no human occupants on the land discovered. Maui-mua remained on the land.

The story goes back to Huku, who, in his sleep (*turamoe*), had a dream (*rikamoe*) that the upgrowth he had seen had reached the surface. His dream was expressed in the chant:

Whakarika mai ana, turamoe ana,
Turamoe ia Rakahanga, ia Rakahanga.

Kua haha, kua haha,
Kua roharoha.

It came as a dream while sleeping,
A dream about Rakahanga, about Rakahanga,
Which has emerged and risen,
And lies spread out.

Tupou-rahi states that Huku did not think out the name Rakahanga, but that the name came to him in a dream.

Huku sailed back to the site of the upgrowth and saw that the land had risen above the surface. He landed at Waiawa and commenced to explore. He met Maui-muri and immediately attacked him to expel him from the land which he considered to be his. In the struggle a portion of the land broke off. It floated away (*rewa atu*) and became Manihiki. Maui fled successively to the places on the atoll named Tumu-whenua, Kaeru, Tumukau, and Paaki. As Huku pursued Maui to Paaki, the rain fell (*kuru te ua*), the lightning flashed (*rapa te uira*), the thunder rolled (*tuki te whatitiri*), and Maui fled away to the heavens (*kua rere Maui ki te rangi*).

After his victory, Huku, returning along the coast, saw a drift coconut (*ponga*) cast ashore. After his return to Nukuangaanga he planted the nut at a spot which he named Te-maru-o-araiawa. He named the nut, or the plant which was to grow from it, Te-huru-awatea. In Gill's account (13, p. 148) no mention is made of a drift coconut. Gill states that Huku returned to Rarotonga because the land was desert (*ha*) and no coconuts had yet been planted. The coconut named Te-huru-awatea he includes with seven others that were subsequently brought. The story of the drift coconut as given by Tupou-rahi fits in better with the subsequent narrative.

According to Tupou-rahi's version, Huku, after planting Te-huru-awatea, returned to Rarotonga. He then made a third voyage in a canoe named

Hotu-rangaranga, taking a supply of planting nuts with him. He also took two paddlers (*hoe waka*) named Ruia and Papera. Seven nuts named Tirohanga, Turuki-wairaro, Papuka, Kai-akuaku, Tumata-whare, and Nuku-angi-angi were planted at Te-maru-o-araiawa. Gill (13, p. 148) gives names which differ slightly, but includes Te-huru-awatea, the name given by Tupourahi to the drift nut of a previous voyage. Te-maru-o-araiawa, where the nuts were planted, is situated on the island of Te Kainga in the atoll of Rakahanga. The two paddlers both died and were buried on Te Kainga. Tupourahi quoted this *pehe* as proof of his tale:

Tanu Ruia tei te turuki,
Tanu Papera tei te paapuka.
Haroi ha.

Ruia was buried at the *turuki*,
Papera was buried at the *paapuka*.

Some of the Rakahangans were inclined to think that the inclusion of the paddlers in the tale was an elaboration, as *ruia* and *papera* are names given to two species of shark.

Huku returned to Rarotonga. Sitting one evening in front of his house, he began to wonder whether the first nut he had planted on Rakahanga had grown into a stately palm. His thoughts found expression in the following chant (*haka*):

Tera paa Te-huru-awatea te tahirihiri mai ra
i Te-maru-o-araiawa.
Perchance Te-huru-awatea is waving its fronds
over there at Te-maru-o-araiawa.

The literal translation of the *haka* conveys merely the thought, but to the descendants of Huku there is music and sentiment in the native words. They take pride in quoting them over and over again. During my stay in Rakahanga the words were called out to me from houses along the village street, for they formed a bond of our mutual interest in the past. When I called them out to my history teachers, their gratification was apparent.

Huku had kept his discovery of a new land secret. A man named Wheatu heard Huku and conjectured that the chant referred to some other land. He embarked in a canoe named Paparinga-tahi, eventually came to Manihiki, and landed at Tarakite. From there he set out and came to Rakahanga, where he saw the palm named Te-huru-awatea waving in the breeze at Te-maru-o-araiawa. He landed at Omoka and dragged his canoe ashore, naming the place Te-amonga-waka (the carrying of the canoe). He went on to a place on the reef called Awanui. There he commenced to cut a channel through the reef to connect the lagoon with the sea and so to provide a passage for canoes. As he worked he sang the following chant, which Gill (13, p. 142) has recorded in full:

Ana mai, ana mai, kurua!	Come along, come along, batter away!
Ana mai ko Wheatu, kurua!	Come along, it is Wheatu, batter away!
E ano ki Rakahanga,	Go to Rakahanga,
Kurua iho, kurua e koe,	Batter it down, batter O thou,
Kurua te papa i Awanui,	Batter the rock at Awanui.
Kurua, kurua, kurukurua!	Batter, Oh, batter, Oh, batter away!
E noho i Tarakite, kurua!	Stay at Tarakite, batter away!
Takahia e koe, kurua!	Stamp on it, thou, and batter away!
Te matangi ko te tonga,	The wind is the south wind,
Kurua, kurua, kurukurua!	Batter, Oh, batter, Oh, batter away!
Ki waenga moana	In the midst of the ocean,
Kurua ko te mata o Wheatu,	Batter the face of Wheatu,
Kurua te uru o Rakahanga,	Batter the head of Rakahanga,
Kurua te awa i Omoka,	Break out the channel at Omoka,
Kurua, kurua, kurukurua!	Batter, Oh, batter, Oh, batter away!

The words *kurua, kurua, kurukurua* of the refrain mean literally "to batter," for Wheatu used a piece of coral boulder to hammer away at the reef and break pieces off in his attempt to cut out a channel. In view of the fact that the Cook Islands Administration has considered the advisability of cutting channels through the reef, the chant is interesting, showing that the problem exercised the minds of the early Polynesian settlers. The early voyager, Te Herui, is credited by tradition with having cut the passage called Te-rua-i-kakau through the reef at Aitutaki, but he had the advantage over Wheatu of having an adz. Another ancestor, Ruatapu, commenced a similar engineering task on the reef at Atiu, but as the food supplies of his employer fell short, he abandoned the work.

Meanwhile, Huku had a premonition that something was happening on the land he regarded as his. According to Tupou-rahi, Huku set sail in a canoe named Te Rawhiti and was accompanied by his sister, Tapairu, and her husband, Toa. According to Gill (13, p. 149), Huku came without them. In Rakahanga, Huku found Wheatu still battering away at the reef at Awanui. To Huku's fierce inquiry as to what he was doing on his land, Wheatu diplomatically replied, "I am battering this rock to make a canoe channel for you." (*E tuki ana au i te papa nei tei ara waka nohou.*) According to one version, Wheatu was allowed to remain on condition that he did not go inland, as Huku was afraid he might pull up the coconuts that had been planted. The version adopted by the people in their historical dramas (see p. 198) is that Wheatu was driven off the island. A short, wide indentation on the inner side of the reef at Awanui is pointed out as the scene of Wheatu's labor, and the opinion is held that he would have completed the channel had he not been driven away. The name of Wheatu does not appear in the local genealogies.

Huku subsequently departed for Rarotonga, leaving the land in charge of his sister and her husband. Gill (13, p. 149) states that Huku sent his sister and her husband to Rakahanga after his return to Rarotonga, and that the canoe in which they came was named Reiapata. Huku here disappears from history, and the peopling of the atoll commences with Toa and his wife.

Huku is generally believed by the people of Rakahanga and Manihiki to have come from Rarotonga. Tupou-rahi stated that he belonged to the land division of Tukuvaine, that Ikurangi was his chiefly mountain (*maunga ariki*), and that his god, Mokoroa-i-taupo, was located at Maungatea. Tukuvaine, Ikurangi, and Maungatea are all well-known localities close to the main village, Avarua, in Rarotonga. So much communication, however, has existed between the atolls and Rarotonga since the advent of Christianity that the possibility of elaboration between the two peoples cannot be disregarded. Mr. Savage told me that Huku appears as "Iku" in the Rarotongan genealogies, but careful checking up is required before the two can be accepted as identical. The number of voyages Huku is reputed to have made between Rarotonga and Rakahanga is probably exaggerated.

The interpolation of the Maui myth is interesting in view of the dialectical affinity between the atolls and New Zealand. Both areas have the story of Maui fishing up the land with a hook and line. The New Zealand story differs in that it presents five Maui brothers instead of three. In both areas the hero of the adventure is the youngest son, Maui-potiki in one, and Maui-muri in the other. Both *potiki* and *muri* refer to the last-born of a family. In the New Zealand story the hook entered a house at the bottom of the sea and caught on the back of the house, which suggests the Rakahangan incident in which Hina-i-te-papa hooked the line into the *papa* or rock where she dwelt at the bottom of the sea. In outline the two stories show an affinity, but they naturally differ in minor details.

Toa and Tapairu settled as permanent colonists on the island of Te Kainga in the atoll of Rakahanga. Tradition states that Tapairu was the sister of Huku and that it was through this blood kinship that Huku gave her the land. Pedigrees of the ancestry of both Tapairu and Toa are lacking. Some informants stated that Huku and Tapairu were the children of Hiro of Hawaiki, but Gill (13, p. 143) records that Tapairu was the daughter of a son of Hiro who came from Hawaiki, presumably, to Rarotonga. An interesting complication is due to the definite mention of a son of Hiro in Rarotongan history. Hiro, the celebrated explorer, was a contemporary of Tangiia, the great Rarotongan ancestor. Tangiia adopted Tai-te-ariki, a son of Hiro, and made him high chief over a section of his people. The Pa-ariki title of the Takitumu tribes of east and south Raro-

tonga descends from Tai-te-ariki. If Huku and Tapairu belonged to Rarotonga, they should have been associated with the Takitumu people. Tupourahi, however, places them in Tukuvaine in north Rarotonga, which is Makean territory, derived historically from a totally different family. It is evident, however, that the Rakahangan historians knew of Hiro, but that knowledge could have been derived from other areas besides Rarotonga. They may have followed the strong tendency that existed among genealogists to connect their ancestors with celebrated historical characters, thus adding luster to their pedigrees.

According to Gill (10, vol. 2, pp. 281, 282), Toa was a great warrior but was defeated in Rarotonga. Gill gives this defeat as the reason why Toa and his wife came to settle in the land discovered by Iku (Huku). He says further, "The Rarotongan chiefs confirm this testimony by relating the departure of 'Toa' from this island many generations ago. He was a great warrior of the Ngati-Tinomana tribe." The tribe referred to inhabits the western part of Rarotonga. Gill also mentions the habit of saying something after sneezing, as though addressing a spirit. On Manihiki it was usual to say, "Alas! alas! Go to Rarotonga." The evidence cited would appear to confirm Rarotonga as the original habitat of Toa and Tapairu.

GENEALOGICAL RECORDS

Because traditional history in Rakahanga attributes the settlement of the atolls to one biological family, the head of that family a defeated warrior accompanied by no priests, the genealogical records of the two atolls thus peopled are poor in extent and detail. As in Tongareva (29, p. 16), the genealogical records cover three periods, settlement, exploratory or migratory, and mythical. The settlement period commenced with the historical settlement of the land and extends to the present time. The exploratory phase covered the period from the departure from an ancient homeland to the beginning of the present occupation. The mythical period dealt with the creation of the gods and the origin of human life. Even in the mythical period the order of creation and natural phenomena were personified and arranged in genealogical order. In the preservation of genealogies, an outstanding element of all Polynesian culture, native scholars have provided a chronological skeleton for traditional history. Whereas the Western historian refers to a calendar date of solar years, the Polynesian refers, then, to the number of generations of human beings (*uki tangata*) in dating past events. Because the genealogies covering the three periods are elaborate, their preservation and teaching were delegated to persons trained to feats of memory. These people, in Polynesia, formed the educated priesthood. It can there-

fore be understood that unless priests accompanied the first settlers to an island the historical records of that island are likely to be abridged and unsatisfactory. The noted explorers of high rank, accompanied by chiefs of status and skilled priests and astronomers, did not seek out small atolls. They preferred the high islands with ample area for distribution and fertility for the production of food supplies. The character of the explorers is reflected in the traditional history, genealogies, and social structure subsequently revealed by the field research of foreign students.

In Rakahanga the only voyages of the long migratory period recorded are those of Huku and Wheatu from Rarotonga. Beyond the statement that Huku and Tapairu were either the children or the grandchildren of Hiro, no pedigrees are recorded to extend over the migratory period from the mythical past. The widespread myth of Maui was evidently one of the few things remembered, and it was interpolated to link with the recent period of Huku. No definite mythical period is recorded, nor are primary parents, represented in some areas by Atea and Papa, remembered. Whakahotu appears in the name of the spot in the ocean whence Rakahanga emerged, but though there is an indication that Whakahotu was personified, she does not appear as a primary nature mother as she does in Tongarevan myth. The god Tangaroa appears as the father of Maui as he does in Rarotongan myth. No reference is made, however, to his brothers, Tane, Rongo, and others who occupy such a prominent position in the Polynesian pantheon. The gods worshiped were local gods not elsewhere known. Rakahanga has preserved even less of Polynesian myth than Tongareva (29, p. 85). The first settler, Toa, must be held responsible for what knowledge of outside history and institutions was brought into the country. Rakahangan chiefs and heads of families subsequently learned the family pedigrees covering the settlement period, for inheritance and succession were based on these, but much has been forgotten since the advent of Christianity.

The family pedigrees covering the settlement period were recorded for this study from evidence given by witnesses before the Native Land Court held in Rakahanga in June, 1929. All the witnesses were acquainted with the main facts concerning Toa's marriages, but only a few could trace a connected line from Toa to themselves. Most could trace pedigrees to ancestors through 6 to 12 generations but could not connect them with the main lines. The families of Toa's daughters were confused, and some ancestors were given different names and different parents.

Out of this confusion a lineage given by the pastor, Kairenga, is selected, as it gives his lineal descent from Toa (Table 1). Another connected line was given by Haumata-tua, but it includes a list of persons who held one of the *ariki* titles. In pedigrees which include lists of *ariki,* younger brothers

who may have held the title are apt to be recited in a direct lineal descent, and the number of generations is thereby incorrectly increased. Unless the collaterals can be checked, it is safer to use a junior line to judge length of occupation.

Table 1. Descent from Toa

1. TOA,m = Tapairu,f
2. Nanamu,f = Toa,m
3. Matangaro,m = ?
4. Rua-ariki,m = ?
5. Matangaro-rua,m = ?
6. Makewa,m = ?
7. Hura,m = ?
8. Ngaro,m = ?
9. Poupou-whenua,m = ?
10. Kanohi,f = Tautape,m

11. Tuteru-matua,m = ?	Te-patiti,m
12. Taura-matua,m = ?	Whakareka,m
13. Umuhau-matua,m = Kapoe,f	Kawahia,f
14. Te-atua-a-Makuha,m = Vaia,f	Te-atua-a-te-poroa,m
15. Tiangana,m = Tapaharoa,f	Munokoa,f
16. Matangaro-teru,m = Munokoa-whakatangata,f	Enoka,m
17. Munokoa-te-mumu-etahi,m = Mehau,f	Takai-tuhe,m
18. Tereao,m = Tokerau,f	Tuhe,f
19. Taura,m = Munokoa,f	Mokoha,m
20. Tereao,f = Munokoa-tea, m	

21. Kairenga,m — Tohoa,m = Miareta,f
22. Mata,m

If the allowance of the Polynesian Society of 25 years to a generation is accepted, the 22 generations from Toa to Kairenga's adult nephew, Mata, would make a settlement period of 550 years. Toa would have landed in Rakahanga in about the middle of the fourteenth century. This date agrees with the date of the last migration to New Zealand and with the approximate date of settlement by Mahuta in Tongareva. Rarotonga was settled by Tangiia about a century earlier.

The first part of Table 1 ends with Kanohi in the 10th generation. Kanohi married Tautape, the last *ariki* to rule singly over the atolls. The period of the dual *ariki* commences with the 11th generation and consists of

12 generations. The column on the right of the table gives the descent in the 11th generation from Te-patiti, a younger brother of Tuteru-matua. This line is three generations shorter than the line given in the left column. Two other lines which connected with the Kanohi-Tautape generation (10) are also about nine generations long, so the second period may be only a little more than 200 years, instead of 300 years as the Kairenga line would indicate. A discrepancy as to the length of the first period from Toa to Tautape on another line is discussed on page 46.

A pedigree skeleton has now been provided to which collaterals may be linked as the story develops.

MARRIAGES OF TOA

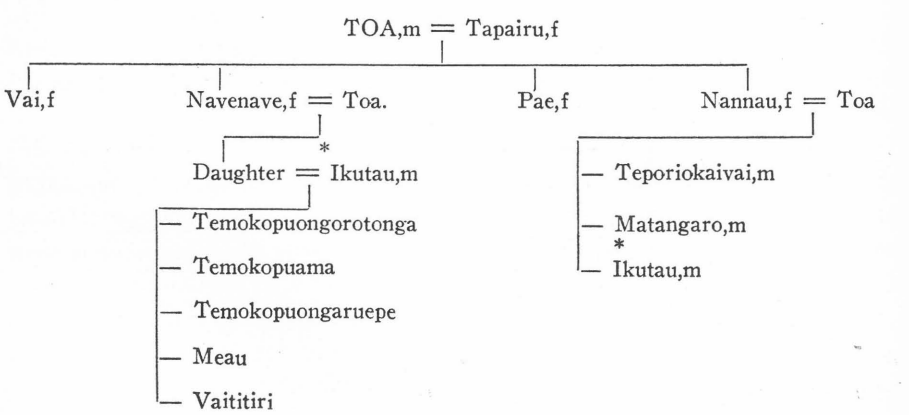
The human population is referred to in Rakahanga as the *kura tangata,* the line of descent as the *katiri tangata,* and the biological family as the *puna.* Toa and Tapairu and their four children are referred to historically as the *puna mua* (the first family). In New Zealand *puna* means a wife and *puna rua,* a second wife. In Hawaii *punalua* means the two wives of one husband or the two husbands of one wife. The two husbands of one wife may be regarded as a late development with a limited distribution. To the Polynesian in general the dominant reason for marriage was the procreation of children to perpetuate the line of descent. Though to the native mind the term *puna* may apply particularly to the offspring, the parents are not entirely disassociated. The very mention of the *puna* recalls the parents, and the *puna* cannot be described without mentioning the parents—"Te puna mua a Toa raua ko Tapairu, e wha tamahine: ko Kae, ko Poe, ko Naunau, e Nanamu." (The first family of Toa and Tapairu consisted of four daughters: Kae, Poe, Naunau, and Nanamu.) The children of this marriage were all girls, and their names are given in order of birth. Some pedigrees give a different order, making Poe first and Naunau last. Gill (10, vol. 2, p. 281) gives their names as Vai, Navenave, Pae, and Nannau, but as every consonant must be followed by a vowel, Nannau at least has been spelled incorrectly. Throughout this early period considerable confusion exists in the pedigrees given by different families.

It is obvious that in the settlement of an uninhabited island by one biological family the perpetuation of the human stock must be continued through incestuous marriages. The members of Toa's first family were all females and he desired male issue (*kua hinangaro ki te kapi tane*). Had some of the first family been males, it is probable that brother and sister marriages would have been consummated to meet the problem. No sons having been born to Tapairu, Toa married his eldest daughter to obtain male issue (*kapi tane*) whereby the line of descent (*katiri tangata*) might be continued.

With a few exceptions, as in Tongareva, close marriages were favored by Polynesians. In the highly sophisticated cultures of Hawaii and Rarotonga brother and sister marriages took place for the purpose of perpetuating chiefly lines of high rank. The theory that peoples of lower cultures have an instinctive horror of incest is not substantiated in Polynesia; where prohibitions exist they may be attributed to a cultural development. Father-daughter marriages probably would not have occurred in Rakahanga, however, except that there was apparently no other solution to the difficulty. The eldest daughter, Kae, bore a female child, and the problem remained unsettled. The child was named Tupunoa, which carries the idea of "growth to no purpose" and bears witness to the disappointment that must have been engendered by the birth of a girl child. Any psychological inhibition against a father-daughter marriage having been once broken down, Toa married his second daughter in search of male issue. Again the child was a daughter. He married his third daughter, Naunau, and, according to some authorities, the issue was again a daughter. Other genealogists state that male issue was born. Toa then married his youngest daughter, Nanamu, in his determination to obtain male issue. Later, he even married his daughter-granddaughter, Tupunoa. The necessity of providing male issue to perpetuate the human species was the dominant consideration.

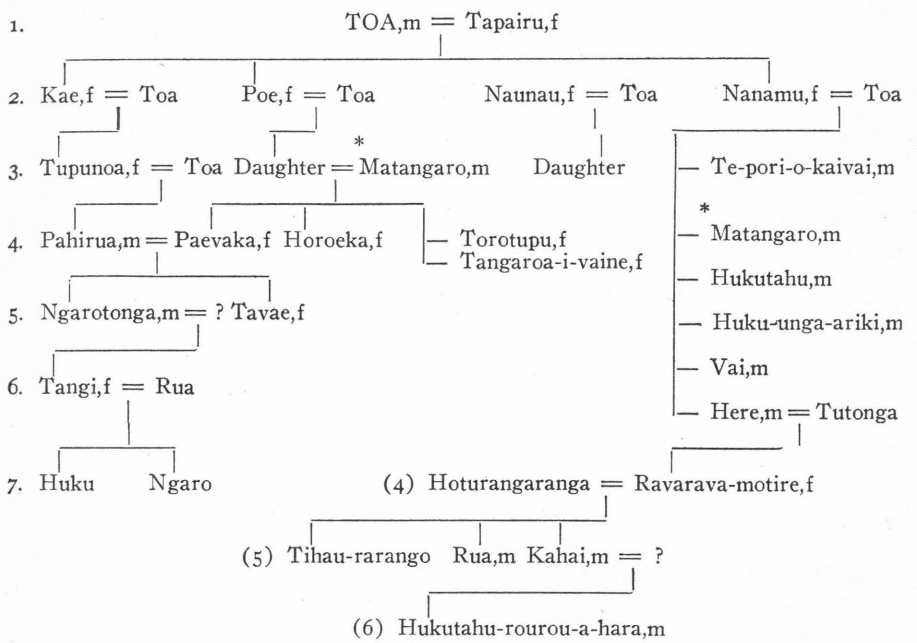
The people of Manihiki and Rakahanga do not express any repugnance at the action of their ancestors, for they say that had such marriages not been made there would have been no *kura tangata*. By both Nanamu and Tupunoa, Toa had male issue. The problem of the perpetuation of the stock having been settled, father and daughter marriages ceased and were not repeated from Toa's period to the present day.

Considerable contradiction exists regarding Toa's families by his daughters. Gill, who visited the atolls in 1852, recorded the following genealogy (10, vol. 2, p. 281):



Ikutau (Hukutahu) married his first cousin and had five children, whose sexes are not given. Attention has already been drawn to the incorrect spelling in this list. The Ikutau family given cannot be traced by the present generation.

From a manuscript written in the native language by Tairi, one of the two first Rarotongan missionaries who went to Rakahanga in 1849, Gill records the following genealogy (13, pp. 143, 144):

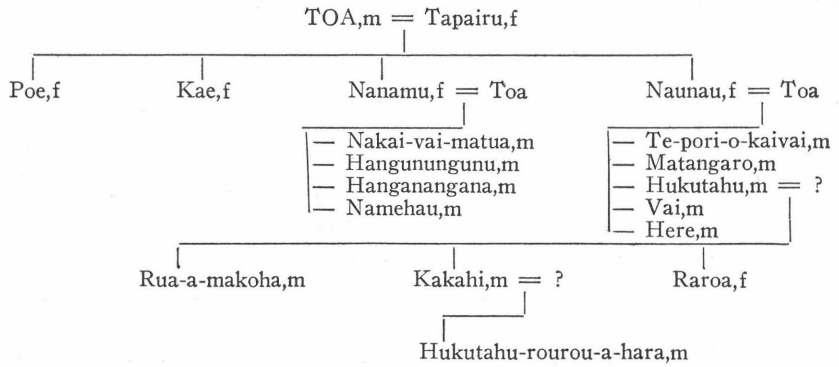


The parentage of Hoturangaranga and Tutonga is not given. They may have been among the retainers of Toa, if he had any retainers. After male issue had been produced by Toa, any restriction that may have existed against marrying with retainers' stock may have been relaxed.

Kairenga gave his own pedigree from Matangaro. He stated that Matangaro married his aunt, Poe, but Gill's pedigree showing that Matangaro married Poe's daughter is more likely to be correct. Kairenga gave Matangaro's family as consisting of two daughters, Paevaka and Horoeka, and a son, Rua-ariki.

Haumata-tua gave the pedigree in Table 2 before the Native Land Court.

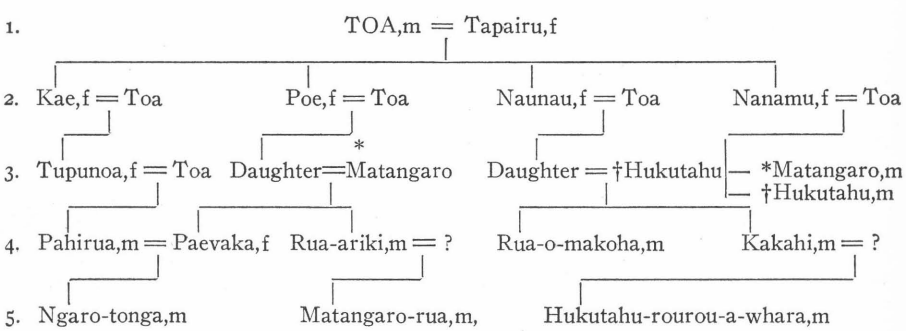
Table 2. Issue of Toa



If this pedigree is compared with that given by Gill, the confusion is apparent. In the two tables, though the names of the mothers are reversed, the brothers Matangaro and Hukutahu are given as the sons of the youngest daughter.

Of the second families, those who became most important were the male children of the youngest daughter. Of these, Te-pori-o-kaivai evidently died young and without issue. The outstanding ancestors are the second and third sons, Matangaro and Hukutahu. On the evidence adduced, Table 3 probably represents more nearly what took place with the main characters in the second group of four families.

Table 3. Second Families



In the second generation, except for the marriage of Toa, incest was avoided, as first cousins were available for marriages. It is likely that other first cousin marriages took place, but the records are as confused. It may

possibly be, as Kairenga maintained, that aunt and nephew marriages took place and that the confusion in the pedigrees is but a reflex of the confusion that actually existed at that period. Matters subsequently righted themselves and it is now immaterial which daughter of Toa produced which family. Certain it is that Matangaro and Hukutahu are the outstanding ancestors from whom descent is traced. Their brothers and cousins, whose alliances are not clear, nevertheless had families whose offspring formed the mass of the community which clustered around the more dominant, or chiefly, lines.

SOCIAL ORGANIZATION

FAMILY PEDIGREES

Family pedigrees record the elements and mechanism of social structure, lineal descent, marriages, sex, seniority, and collaterals in each generation. The sex and order of birth in each generation were always recited, but collaterals were left for their own descendants to trace. The skilled genealogist, however, besides knowing his own lineal descent, memorized the descent of the leading families in the community and could, by acquaintance with the collaterals of each generation, show how all the families were linked together by common ancestors of more recent date and how they all descended from the original biological family. He could demonstrate how all the inhabitants of the atoll were linked together by a common blood tie.

Owing to the partial dislocation of native culture that followed the advent of Christianity in Manihiki and Rakahanga, however, many of the distant marriages in the pedigrees have been forgotten. One native, Kairenga, for example, was unable to give the marriages in his pedigree from the 4th to the 9th generation. He was doubtful about the 11th and 12th generations, but from the 13th generation onward he recited them as a matter of course. Some children who died young, or adults who had no issue, have been dropped out of the records in the course of time. It is the living descendants who perpetuate lineal descent.

The value of even the last part of Kairenga's pedigree in establishing his social position is illustrated in the following summary of the sexes and order of births in each generation. Kairenga's own ancestors are represented by capital letters under "order of birth," and Kairenga is represented by the capital in the 21st generation.

Generation	Males	Females	Order of birth
12	2	1	M, f, m
13	1	1	M, f
14	1	2	M, f, f,
15	3	3	M, f, m, f, f, m
16	3	1	M, m, f, m
17	2	2	m, f, M, f
18	6	1	M, m, m, m, f, m, m
19	2	1	M, m, f
20	2	1	F, m, m
21	2	1	M, m, f
—	—	—	
10	24	14	

Kairenga was senior to all descendants of the younger brothers and sisters of the five generations from the 12th to the 16th. In the 17th genera-

tion his male ancestor was born third in a family of four, but he records that the elder brother and sister of that generation had no issue, so he retained his seniority in the 17th generation. In the 18th and 19th generations his ancestors were again first-born males. In the 20th generation the male line was broken, but Kairenga's mother was the first-born and senior in birth to her two brothers. If a patrilineal title had descended in the line succession would have gone to the oldest brother of Kairenga's mother and to his male issue. There was no title, however, and Kairenga's mother, from her position, had an important share of family land, which was inherited by her son. Kairenga himself was the senior member of a large family community. This would only have been possible under a bilateral system of tracing descent.

The family, because the parts played by husband and wife in reproduction were fully recognized and the child regarded as flesh and blood of both parents, was bilateral and traced its descent through both parents. Other things being equal, more importance was attached to patrilineal descent. If, however, the mother came of a more important lineage than the father and more land and property were inherited from her, matrilineal descent assumed a correspondingly greater importance. A mother of high rank might form a break in a male line, but even so it was more important to be joined to an illustrious line by a female link than to be connected by a male link to an insignificant line. Patrilineal descent was, however, all-important in succession to rank and title. (See pp. 52, 54.) A female break in the *ariki* line was usually fatal to succession.

RELATIONSHIP TERMS

The enumeration of the names of individuals in pedigrees is sufficient record for the dead. For the living, who are in constant communication with each other, terms to indicate degrees of relationship are derived from the pedigrees.

As about five generations are all that are normally contemporary, it is for five generations that relationship terms have been provided. The terms denote the relationship of any member of the blood community to a person speaking or a person spoken to, and they give a key to social structure. An adult male of middle age may, in his lineal descent, have both parents and grandparents alive who have lineal pedigrees one and two generations respectively shorter than his. If he has children and grandchildren, their lines of descent are one and two generations respectively longer than his. The names of ancestors are checked off on the fingers as relationship is being determined. The person speaking or spoken to is placed in the middle stratum, regarded as 0. His parents are on the — 1 and his grandparents

on the — 2 stratum before him. His children are on the + 1 and his grandchildren on the + 2 stratum after him. With him on the 0 stratum are his brothers and sisters. (See Table 4.) The — 3 and + 3 strata are included in Table 4 to show terms used for extensions beyond five generations. Wissler (33, p. 160), in showing the same idea of genealogical strata in relationship, while treating the person speaking (self) as 0, places the older brothers and sisters on the — 1 stratum above, and the younger brothers and sisters on the + 1 stratum below. This makes the parents — 2, the grandparents — 3, the children + 2, and the grandchildren + 3. This numbering does not express the Polynesian system of counting, for brothers and sisters are collaterals and are not on the vertical line of descent. They must occupy the same horizontal on the 0 stratum but will fall into vertical collateral columns on the left or right of the speaker, according as they are older or younger than he. Both sex and seniority are given expression in relationship terms.

Table 4. Relationship Terms

Generation stratum	Senior collateral	Lineal	Junior collateral	Marriage	Adoption
— 3	Great-grand-uncles and aunts *tupuna*	Great-grand-parents, *tupuna*	Great-grand-uncles and aunts, *tupuna*		
— 2	Granduncles and aunts *tupuna*	Grandparents, *tupuna*	Granduncles and aunts *tupuna*		
— 1	Uncles, *metua-tane;* aunts, *metua-wahine*	Father, *metua-tane;* mother, *metua-wahine*	Uncles, *metua-tane;* aunts, *metua-wahine*	Father-in-law and mother-in-law, *metua-huangai*	Adoptive parents, *metua-whangai*
0	First and second cousins, *tuakana*	Self older, younger, *tuakana teina*	First and second cousins, *teina*		
+ 1	Nephews and nieces, *iramutu*	Son, *tama;* daughter, *tamahine*	Nephews and nieces, *iramutu*	Son-in-law and daughter-in-law, *hunonga*	Adopted children, *tamaiti-whangai*
+ 2	Grandnephews and nieces, *mokopuna*	Grandchildren *mokopuna*	Grandnephews and nieces, *mokopuna*		
+ 3	Great-grand-nephews and nieces, *mokopuna*	Great-grand-children, *mokopuna*	Great-grand-nephews and nieces, *mokopuna*		

When two individuals wish to decide their collateral relationship, they count generations from a common ancestor. The two counts are compared and one subtracted, and as the difference is usually between — 2 and + 2,

the collateral relationship terms can be determined. Most greater divergences that took place during the long period from remote ancestors have been closed by marriages in the pedigree line. It is from the nearest common ancestors that collateral relationship is decided; wider divergences from remote ancestors are matters of only academic interest. Thus the simple mathematical system in use could establish the relationship term between any two individuals so long as they could trace lineal descent from a common ancestor.

The following correlative terms denote sex: *tane* (male or husband), *wahine* (adult female or wife); *tuangane* (brother of sister), *tuahine* (sister of brother); *ure* (son), and *hika* (daughter). *Tane* and *wahine* may be used as qualifying terms to distinguish sex in relationship terms of common gender.

The position on the horizontal levels of the following terms, which distinguish lineal and collateral descent in generations and terms of relationship by marriage and adoption, depends on their vertical count from the nearest common ancestor:

TUPUNA. Includes the grandparents in lineal descent and their brothers and sisters. Also applies to all collaterals who count two generations less from a common ancestor or to all who fall in the —2 stratum. Sex is indicated by adding qualifying terms as in *tupuna-tane* (grandfather) and *tupuna-wahine* (grandmother). *Tupuna* also applies to all generations beyond that of grandparents and is used as a general term to denote ancestors. Great-grandparents, however, may be designated as *tupuna-tuarua* (second grandparents) and great-great-grandparents as *tupuna-tuateru* (third grandparents).

METUA (a dialectical form of *matua*). Applies to parents, uncles, aunts, second cousins, and other collaterals on the —1 stratum. In some regions *matua* applies particularly to the male sex, and the female sex may be indicated by a different word, such as *whaea* or *whaene* in New Zealand. In Rakahanga, however, *metua* is common gender and sex is indicated by adding *tane* or *wahine*.

METUA-HUANGAI. Applies to fathers-in-law and mothers-in-law. Here *metua* indicates the —1 stratum, for marriage puts the husband and wife on the same stratum as regards relationship with the parents of both contracting parties. The husband and wife still retain the relationship to each other indicated by their respective generation strata. The marriage relationship is indicated by *huangai*, which corresponds to the English "in-law".

METUA-WHANGAI. An adoptive parent; *metua* shows the generation stratum and *whangai* (to feed) refers to the outstanding feature in adoption. Polynesians in speaking English often refer to their "feeding father" or "feeding mother," which conveys the meaning of *metua-whangai* better from a Polynesian angle than "adoptive parent".

TAMA. Son.

TAMAHINE. Daughter, *tama* with the female suffix *hine*. Also used to denote female first cousins once removed, female second cousins once removed, and other more distant collaterals who are on the +1 stratum.

IRAMUTU. A special term to denote nephews and nieces, fairly widespread. Applies to the sons and daughters of brothers and sisters, whether they are older or younger than the speaker.

HUNONGA. Son-in-law or daughter-in-law, expresses both the generation level and the marriage relationship.

TAMAITI-WHANGAI. Literally, "feeding child". Applies to an adopted son or daughter.

TAMAITI. Used in *tamaiti-whangai* to denote the generation level. Also denotes collaterals beyond the degree of consanguinity of nephews and nieces. May be used as the male correlative to *tamahine,* and thus includes first and second cousins once removed and other collaterals on the + 1 level.

MOKOPUNA. Denotes grandchildren in lineal descent and extends laterally to include grandnephews, grandnieces, first and second cousins twice removed, and all collaterals on the + 2 level. The term also applies to great-grandchildren and relatives on the + 3 level. It may extend further to great-great-grandchildren and relatives on the + 4 level. The general term may be qualified by a number to denote the degree or removal as follows:

+ 2. Grandchildren—*mokopuna.*
+ 3. Great-grandchildren—*mokopuna-tuarua* (second).
+ 4. Great-great-grandchildren—*mokopuna-tuateru* (third).

The method of deciding relationship terms which denote seniority within a family works horizontally instead of vertically. Though only two terms are used, they have a far-reaching application. Their first application is shown on the 0 stratum in Table 4. The seniority terms are:

TUAKANA. Elder brother of a male; elder sister of a female; a relative of the same sex, who is an equal number of generations removed from a common ancestor but who is descended from an older brother or sister in the common ancestor's biological family.

TEINA. Younger brother of a male; younger sister of a female; a relative of the same sex who is an equal number of generations removed from a common ancestor, but who is descended from a younger brother or sister of the common ancestor's own children.

Seniority terms are correlative as regards age within the same sex. They are not applied in ordinary speech to brother and sister, though they may be referred to theoretically to denote priority in date of birth of individuals of opposite sexes. Seniority was all-important in the old social structure in deciding rank and title and relative degrees of influence in family and community gatherings. Certain terms were applied to the first-born son of a family, but such terms were restricted to one person. Dates of birth could not be recorded, but as children were born the terms used automatically placed them in their order of seniority. Thus when the eldest son died seniority within his generation naturally passed to the next brother, who was *tuakana* to all the others.

The seniority inherited through order of birth was transmitted through the individual members of the family to their descendants. Seniority as

expressed by the *tuakana* and *teina* terms was horizontal in one biological family but was traced vertically in collaterals back to the family of the common ancestor. Thus in Table 4 the terms have been arranged in senior and junior collateral columns on either side of the lineal column. The senior collaterals are *tuakana* to those in both the other columns and the junior collaterals are *teina* to the other two. The descendants of the senior collaterals will always be on the left of the lineal column in the senior position, and similarly the descendants of the junior collaterals will always be on the right in the junior position. As they pass down through the generation levels they receive the relationship term of the particular level, but their senior or junior relationship will always be recognized. Order of birth in each biological family places individuals and their families in senior or junior positions with regard to other individuals and families.

On the 0 level the truly collateral terms, *tuakana* and *teina,* are applied to brothers and sisters. The nearest of kin on this level are first cousins who are 2 generations removed from the common grandparents in both the lineal and collateral columns. Their relative position is merely an extension of the principle governing the individual members of one biological family. The children of the uncles and aunts who are older than the lineal father are classed as *tuakana,* and the children of the younger uncles and aunts are *teina.* The next nearest of kin are second cousins who are 3 generations removed from the common great-grandparents on both the lineal and collateral lines. They are divided into *tuakana* and *teina* according to whether their grandparents were senior or junior to the grandparents in the lineal line. In a similar way the classification extends to the third, fourth, fifth, and sixth cousins, and so on, as long as two lineal lines have the same number of generations. Theoretically, it could extend back to the first family of occupation, in which circumstance the seniority would be derived from the children of that family. What happens in practice, however, is that more recent marriages lead to a readjustment of relationship strata from a more convenient point of calculation. When members of a junior line marry into a senior line, it is natural for their descendants to trace descent through the senior line if they gain extra advantages by doing so. A person was often *tuakana* to a relative on one line of descent and *teina* to him on another. In some Polynesian areas, for example, New Zealand, a special term was used to designate such a double relationship, but no specific term seems to have been used in Rakahanga. Though the *ariki* title went by seniority, an *ariki* might have several *tuakana* in the community, owing to the marriages of his ancestors. His father might have married a younger sister, and thus all the children of his mother's older brothers and sisters would be *tuakana* to

him. As the title came from his father's side, this seniority would not affect him except in courtesy toward them. Similarly, the children of his father's elder sister would be *tuakana* to him, but again seniority through a female line would not affect him as regards his office. Thus the *tuakana-teina* relationship permeated the whole of society, and the respect and deference paid to seniority was indicated by its wide application not only to individuals on the same generation level but to families and groups. Its power, however, varied with the degree of consanguinity and its derivation through a male or female line.

Two terms which did not fit into the collateral system based on seniority were used to denote brother and sister, *tuangane* (brother of a sister or the male relaitve of a female, both an equal number of generations removed from a common ancestor), and *tuahine* (sister of a brother or the female relative of a male, both an equal number of generations removed from a common ancestor). These have not been included in the table of relationship terms. Personally, I feel that there is an implied sex superiority in the term *tuangane* and an implied inferiority in *tuahine*. These terms fill in the gap left by the restrictions applied to *tuakana* and *teina,* which are fundamentally correlatives to denote superiority of birth. The restriction of *tuakana* and *teina* to members of the same sex is to prevent their use between opposite sexes. A logical reason for this usage would be to prevent some danger. The danger, as I see it, was to the male succession to rank and title through seniority of birth. No danger could arise from the use of terms among sisters to denote their relative positions in the female sphere of activity. If, however, a sister were termed *tuakana* to a younger brother, her seniority to him in the family would be admitted, regardless of sex. A first-born female would be *tuakana* to the rest of the family, and her claims would be hard to combat. It seems plausible, therefore, that those who guided the evolution of social structure provided against such a contingency.

In most Polynesian dialects proper names as applied to the different sexes have been in use so long that masculine and feminine names have become differentiated by usage. Masculine names have, however, been given to females, and feminine names to males. In Rakahanga the naming of either sex by the same name is so prevalent that there are very few names which are not common to both sexes. Of the few which are not common, a male name is Atua, as in Te-atua-a-tupou, Te-atua-a-maheanga, and others. Though *tane* is used to distinguish the male sex in relationship terms, in proper names the male suffixes are *matua* and *tangata.* The term *matua* is a common term applying to the —1 generation, and when used as a relationship term it has to be qualified by *tane* or *wahine* to distinguish sex. In proper names, however, such as Temu-matua, it invariably indicates the male

sex. Similarly, *tangata* refers primarily to human beings as distinguished from other animals or the gods, but in proper names it is restricted to the male sex, as in Munokoa-tangata. In feminine names the general sex suffix is *wahine,* as in Temu-wahine, but the senior daughters of chiefly families have the special suffix *tapairu,* as in Haumata-tapairu and Takai-tapairu.

The word *ure* (boy) and *hika* (girl), formerly used to indicate the sex of children in pedigree recitations or conversation, indicate the male and female organs of generation. There was no diffidence in using them to denote sex until prurient ideas of Western culture had affected the natives. The people are now ashamed to use these terms.

It is reasonable to think that the terms *tupuna, metua, tama, tamahine,* and *mokopuna* were originally used descriptively in lineal descent and that the collateral terms *tuakana, teina, tuangane,* and *tuahine* were confined to members of the same biological family. The collateral extension of the parent term *metua* to include uncles and aunts is natural, when the conditions under which the families developed are considered. The people lived in composite households or in households close together. The uncles and aunts extended to nephews and nieces the care and affection they gave to their own children. Uncle and nephew had mutual obligations toward each other, and the extension of the parent term toward the uncle stressed the closeness of relationship. As the child grew up he knew which of his *matua* was his actual father and he learned that other *matua* were brothers of his parents. The learning of degrees of consanguinity was part of the cultural education, knowledge that opened out gradually before the child with the learning of his pedigree. It evidently did not occur to the ancestors that there was a need for a descriptive term to distinguish between uncle and father to avoid confusion, for there was no confusion in their minds. Further extension of relationship terms to group all relatives on certain levels was a continuation of the principle of binding the people together through a common blood tie. The relationship terms were used to express blood obligations inherited through mutual ancestors. Social structure was based upon cooperation and support of institutions by as many of the blood-kinsmen as possible.

The derivation of relationship terms from pedigrees which stratify relatives in generation levels, called by ethnological writers a "classificatory" system in contrast with the European "descriptive" system, is typical of Polynesia. It is true that the classificatory system lacks the exactness of the descriptive system. The classificatory system contains a few terms which apply to many relatives, whereas the descriptive system contains more terms and brings out remoteness of relationships more carefully than does the classificatory system. The contention of Kroeber (17) that relationship

terms are influenced by psychology is upheld in explanations of the usefulness to the Polynesians of their system. It was to the desire to maintain touch between collaterals no matter how far distant that the Polynesian relationship terms gave expression, and there was no need for exactness inherent in the terms themselves.

THE BIOLOGICAL FAMILY

The Household

It is probably largely because of the nature of the Polynesian household that foreigners have been led to regard the Polynesian as overlooking the importance of the biological family as a unit of social structure. Western culture is individualistic, and from the Polynesian point of view, selfish. The European tendency is not to share dwellings, food, property, or children. Relatives are not encouraged to stay indefinitely with the European family, a procedure almost incomprehensible to the Polynesian. Europeans, except in families holding ancient titles or inherited social position, do not keep family pedigrees. Relationship terms are restricted to a few degrees, and collateral terms have no vital meaning. The idea of kinship obligation and coöperation has weakened. The unit of money has displaced community coöperation in supplying man power for tasks beyond the scope of the individual. Villages and towns are accumulations of individual family units, independent of each other and having no common blood tie to unite the whole community. When members of one family do establish their households in the same village or town, they become separate independent units. Although the separate households recognize close relationship and may coöperate more closely with one another than with unrelated households, they develop different occupations and interests, and one household cannot dictate the policy of another by right of kinship. In the course of time, when relationship becomes remote, the diluted blood tie assumes a merely historical interest. Migrations are frequent, and separation further weakens any influence that blood kinship might have exerted. Thus collateral relationship ceases to exercise an active influence in social structure.

The Polynesian household offers a marked contrast. Although the nucleus of the household is the *puna,* or single biological family, it is augmented in various ways. A son may elect to live with his parents after reaching adulthood. He marries and brings up his children in the same household, which thus comprises three generations. As the couple of the first generation grow old they relinquish the active management of the household to the couple of the second generation. The younger couple does the harder manual work in providing food and other necessities. The old people

do the light tasks and take care of the grandchildren. Parental authority becomes divided, and the grandparents exercise an active share in the upbringing of the children of the third generation. Two brothers of the second generation or a sister with her husband may also remain with the parents. If the family is wealthy in land, some poor collateral may live in the household and assist in cultivating the land and procuring food supplies. Some of the children of the third generation may be adopted by other relatives and thus pass away from their own family. On the other hand, the family may adopt children of other relatives and bring them up in their own household. The household, through the recognition of the blood tie and the prevalence of adoption, is thus rarely confined to one biological family. The children come under the influence and instruction of grandparents, aunts, and uncles, so that the clean-cut parental control characteristic of Western culture is not sharply defined, though it is recognized. The composite household, comprising members of three and even four generations, is in a fluid state, affected by the ebb and flow of blood kin. Seniority of birth indicates the family head. The source of the complex household is the first biological family in occupation. The bilateral biological family is the unit on which family pedigrees are built up, and the position and relationship of each individual member is clearly defined by the family pedigree.

The household residence consists of separate buildings devoted to cooking and sleeping. The cooking house is shared by all. The food supplies are pooled, cooked in one earthen oven, and shared among the members of the household. The sleeping house accommodates all.

Birth

The great desire of the single biological family (*puna*) was to have male issue (*kapi tane*). The intensity of this desire led to incestuous marriages in the beginning of the history of the atolls. The general Polynesian attitude toward children was that females, through marriage, were likely to be lost to the local group or subtribe, whereas males, owing to the prevalence of patrilocal residence, strengthened their own community. In prominent families the desire for male issue was increased by the law of male succession to rank and title. A young married couple occupied by love and appreciation of each other's physical perfections probably dwelt less on the idea of male issue, though the desire must have existed. To the parents of the couple, however, the desire for male issue was dominant. The romantic side of the marriage did not affect them. The chiefly parents of the husband looked forward to a grandson to carry on the line, to succeed to the title, and to inherit the estate. A granddaughter would merely be a wife for some other family. The feeling was naturally shared by the husband's family and

tribe. The desire for male issue, curious though it may seem, was also shared by the parents of the wife and her tribe. They were actuated by the wish to see one of their blood occupying a high position, even though it be in another tribe. Although the sex of the wife may have been regarded as a mistake at the time of birth by her people, once she was married to a high chief she assumed importance in their eyes. She was the potential mother of a chief who would be of their blood. Considerable friction occurred from time to time between the families of two wives married to one chief, owing to the interest taken in the first son born of each marriage, and led to the establishment of a land distributor (*tuha whenua*) in the 6th generation and of the dual *ariki* in the 11th generation.

When the news reached the parents of the newly married couple that the wife was pregnant, general satisfaction was expressed. Both mothers-in-law commenced to plait garments of split hala leaves (*papa*) for both the prospective mother and child. As the time of confinement arrived, the parents-in-law prepared to give a feast in celebration. If the child born was a male there was great rejoicing. The news was called (*ka karangatia*) throughout the village. A feast was the material expression of the general rejoicing. If the child was a girl, however, the disappointing news filtered out, but there was no public announcement. The food prepared was eaten, but there was no feast. It was stated by my informant that after the birth of a daughter the husband sometimes left his wife in disgust.

The accouchement was carried out in the squatting position. The patient sat on the floor reclining against a relative of experience. When labor pains came on the patient was pushed up into the squatting position, and she supported herself also by holding to a rope hanging down from a rafter. The support assisted her in bearing down. Older female relatives assisted her by massaging the back and lower limbs between pains. The child was received on a plaited mat held by an assistant.

The placenta was taken away and placed in a hole dug for it at some appropriate place. A little earth was filled in, and a coconut was planted above the placenta. Mr. Savage informs me that the coconut is always referred to as the *weri* of the afterbirth of the child. As the plant grew it was observed from time to time. Its manner of growth was supposed to indicate the nature of the growth of the child. If growth was vigorous the child would be healthy and strong, but if it was poor the child would be correspondingly weak and ailing.

When the umbilical cord was tied and cut, the short end which remained attached to the child was termed *pito* and when it dropped off the umbilicus was also termed *pito*. The short length of cord that dropped off in natural course of time was differently disposed of for the two sexes. The male

pito was taken to the ocean side of the island and cast into the sea. This action, Mr. Savage informs me, was referred to as "titiri ki te moana roa" (casting into the long ocean). It was a form of sympathetic magic to insure that the child would develop into an expert fisherman or find success if he made voyages on the long ocean. The female *pito* was taken to the lagoon side of the island and cast into the lagoon waters. This was termed "titiri ki te tai roto" (casting into the inland waters). Man's sphere was in the ocean waters outside the bounding reef, but woman's sphere was in the waters of the lagoon. The treatment applied to the female *pito* insured that when she grew up the girl would become an expert diver in procuring *pahua* (*Tridacna*) and would be able to remain under water for a long time.

In addition to the placental tree (*weri*), one or more coconut trees were planted by the parents or an elder of the family on family land to commemorate the birth of the child. Such trees were regarded as the special property of particular children, to whose exclusive use they were reserved. The custom and the trees, which were to provide a beverage for the children in years to come, were termed *wai* (water, coconut fluid).

Childhood

Children, as they grew up, were instructed in the observances of life as they came under the influence of the elder members in the composite household. Grandparents, who had more time than the parents, told them tales and myths and probably gave more instruction than the parents. The children played with tops and darts on land. Within the calm waters of the lagoon they early learned to swim and to handle canoes, and so laid the foundation to future success as fishermen and seamen.

Mr. Savage writes me that girls of high rank were specially cared for from childhood. A female child was kept in a private house and attended by an elder woman of the family. During the period of childhood she was carefully fed, and her limbs were massaged with the coconut oil (*romonga*) prepared from mature nuts. She received careful attention in early childhood as regards the processes of excretion. After micturition or defaecation the parts were washed and gently patted during the washing. Such action is the natural care of children during babyhood, but its continuance with a selected attendant went with higher rank. The careful feeding and massaging was influenced not only by affection, but in order that the girl should become well-favored for some future marriage of note.

The care lavished on a female child of rank was increased as she reached puberty. At about the age of the first menses she was kept guarded in a house by the mother and female attendants. This seclusion was for two purposes, to keep her from exposure to the hot sun to render her skin fair, and

to prevent her from obtaining any premature sex experiences. When she was allowed outside for physiological reasons she was accompanied by female attendants to guard her from any love affairs that the desires of her age might dispose her to entertain. Walks for the purpose of exercise were taken in the evening, to protect her skin and also to prevent others from seeing her too closely. Always, she was guarded by female attendants.

A third reason for the seclusion and night walks was to keep the form and beauty of the girl a secret from other families until she should make her public début. During the period of seclusion the best foods obtainable were contributed by the family and subtribe to make her well-nourished, for plumpness was one of the standards of beauty acquired and required by the upper classes. The greater the impression created at the official début of a girl of rank, the greater the credit and satisfaction to her family and subtribe. That a girl of high rank was being kept in seclusion was known throughout the village. All in the community, particularly the families of rank who had marriageable sons, were interested. Thus the whole population looked forward to the time when the girl would make her public appearance.

Puberty

The public appearance of the girl took place at puberty. She had had her first menses and was considered fit for marriage. The ceremony of showing her to the people was termed *whakahinga,* according to Mr. Savage, and was associated with the father of the girl. Thus, if Mika was the father of the secluded girl, the approaching ceremony was promulgated through the village as "te whakahinga a Mika" (Mika's *whakahinga*). The event took place at a religious inclosure or marae at which the people gathered, after the announcement of time and place. The maid was dressed in a particular form of *tipora* garment, consisting of a sennit belt (*tu kaha*) supporting a small rectangular apron of plaited material (*tautape*) in front and a similar *tautape* behind. She was escorted to the gathering place by her family and on the marae was subjected to the scrutiny of the people, who appraised her physical beauty. It was stated that girls treated with seclusion and good feeding developed beautiful figures with skins of velvety softness. The brother of the girl's mother had the right to remove the maid's garment. He untied the *tukaha* belt and removed it, with the two *tautape* aprons. The girl thus stood entirely naked, but she folded her hands in front of her for concealment. The adults inspected her figure and shape. Viewed from the back, if her lower limbs were close together (*piri*) it was held that she had been virtuous. Her general demeanor was also observed. From the native point of view, no girl had any need to feel shame at the exposure of her naked form which custom allowed on such an occasion. If well formed,

she had every reason to be proud, for the ceremony was a public honor from which she would derive the appreciation and admiration of the people. She was getting publicity that would insure an advantageous marriage. Her only cause for fear was that if she had managed to elude her guards and had given away her virginity, the fact might in some way become known to the public The shrewd onlookers studied her with the knowledge that guilt is sometimes manifested in psychological behavior.

During the ceremony on the marae the maid, from association with a religious structure, was tapu. During the period of seclusion she was also tapu, in the sense of being restricted from intercourse with outside people. After the inspection on the marae had been concluded, the maid was conducted through a complementary ceremony. Presumably her garments were restored to her, and she was taken to a place called Taipari. This excursion found expression in the words, "E ue haere ki to koutou whenua ko Taipari." (Go to your land at Taipari.) There she was bathed, and a ceremony in which incantations and leaves were used was performed over her. No details were available, but I was informed that the ceremony made the girl *noa* (common), to enable her once more to mix with the public. I understood from my informants that the second ceremony was termed *whakapu,* but Mr. Savage seems to indicate that the word *whakahinga* used for the first part is an alternate term with *whakapu.* After the ceremony, though the girl moved about with fewer restrictions, she was still watched, as all the trouble taken was for the purpose not only of advertising the family but of making an advantageous marriage. A certain amount of restriction was enforced until the marriage was arranged and completed. The family and the social group had contributed food in order that she should be kept fair and virtuous for marriage. They had a share in her, and a worthy alliance was necessary to justify the interest and support they had given.

The *whakahinga* and *whakapu* ceremonies were observed in the few families of high rank, particularly for the high-born *tapairu* of the *ariki* families. Among the general mass of the people such restrictions were not imposed. Both sexes had early love affairs with sex experience. Sex restrictions were not actively imposed as a rule until after marriage.

I was informed that young men were also treated at puberty to seclusion and the subsequent public appearance on the marae. It was after or during the visit to Taipari that a father took his son to all the islands on which he owned property. He pointed out his shares of land and indicated the landmarks. The visit formed an instructional tour during which the boy committed the information to memory for future guidance. After this, the boy was qualified for marriage.

Marriage

Among junior branches of families which had come to form the mass of the people, it is probable that matings took place without much ceremony. Young people who wished to prolong love affairs and to continue to live together probably did so without much ado. The cohabitation was soon noticed by their respective parents and perhaps ratified at a small feast by the two families. The couple might also obtain the consent of their parents beforehand, and the mutual consent of both families would ratify the marriage.

For children of senior and chiefly families, marriage arrangements were much more formal. Males in the line of succession to the titles of *ariki, tukuwhare,* and to leading positions in subtribes, and girls of chiefly family who had been subjected to the *whakapu* ceremony, were public characters in whom the greatest interest was taken by the families and social groups to which they belonged. Any loose alliance conducted in a common way was not conducive to the maintenance of family and group prestige. Marriages of those of high rank were thus of public concern.

Marriage alliances were discussed at meetings called for the purpose. When the parents or elders of the family came to a preliminary decision, they discussed the matter with the leaders of the families within the group or groups concerned. The decision was made at a public meeting, and carried the support of the group. Most decisions were quickly arrived at by those most intimately concerned, but the longer course of submitting matters to the group was necessary in order to give them a share in discussion and, by their public ratification, to obtain their hearty support in providing the food and property necessary to the marriage ceremony. Objections raised by parents to what they considered unsuitable marriages have, on occasion, led to romantic marriages in which the parental wrath was braved.

The marriage having been consented to by all concerned, the members of the two family groups set to work to plait garments and mats for a marriage dowry. The dowry is termed *takahinga* (*takahi,* to stand on), as the mats form the material on which either party will stand in the house of the other. The women prepare the garments and mats, and the men collect and prepare food to accompany the *takahinga.* The bride's tribe (*matakeinanga*) escorts the girl in procession to the house of the groom's father, carrying dowry and food, to the accompaniment of singing and dancing. The *takahinga* and the food is formally presented to the bridegroom's family. The bride's people then retire to their own part of the village to await the reciprocal part of the ceremony.

The bridegroom's tribe now escorts the bridegroom to the house of the bride's father. They, in turn, take a *takahinga* of garments and mats and

also food, which is presented to the bride's family with the appropriate speeches. In this manner both tribes share equally in the expenses, and each tribe contributes the food for the feasting of the other. The dowries are also distributed in the two groups, and though some may not receive as much as they gave, all get an ample share of the food to which they have contributed. The principle governing such ceremonies is one of public contribution followed by public redistribution. From the public speaking, singing, dancing, and feasting, the groups derive much pleasure. The exchange of gifts and accompanying speeches and reciprocal feasts give the alliance public recognition and constitute the main features of the marriage complex among the upper classes.

Later, the husband is escorted back to his father's house, where the parents of both parties weep loudly and even cut themselves as a sign of grief that their direct authority over their children has ceased. This public demonstration of removal of parental control indicates that the married couple can now set up a household.

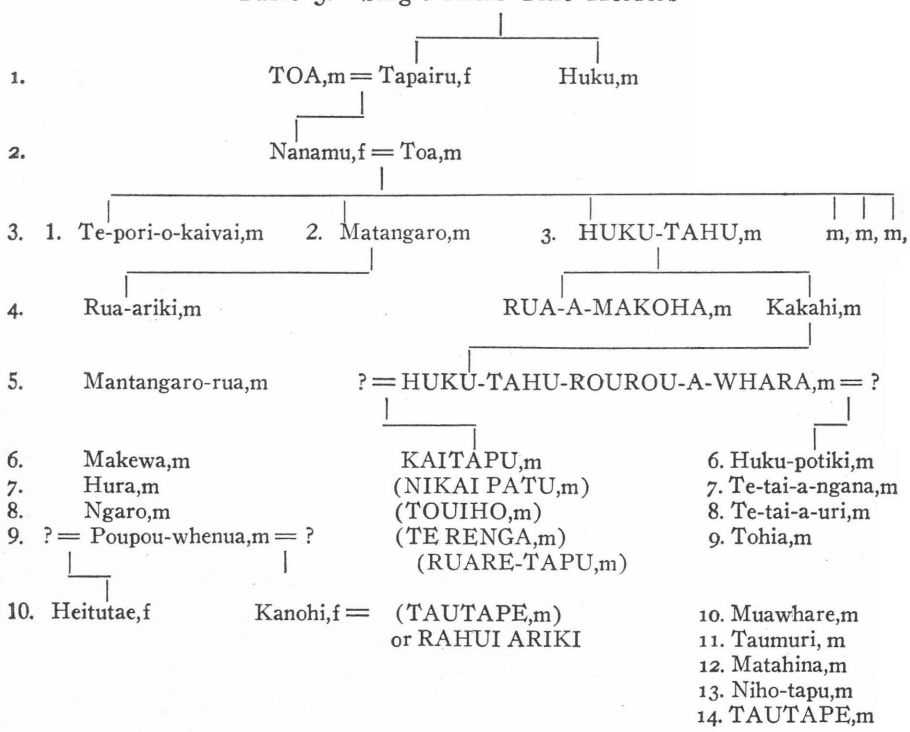
TITULAR SYSTEM

History of the Single and Dual Ariki Titles

Primogeniture, or seniority in the male line, governs succession to rank and title in the Cook Islands and in the Society Islands. In the Cook Islands *matahiapo* is a general term for "eldest son," but in certain family groups the *matahiapo* is a title held in the senior family. The *ariki* (chief) is simply the senior *matahiapo* of a number of family groups which have branched out from the original family. The more numerous the family groups, the greater the seniority and power of the *ariki*. The leaders of the expeditions which settled the islands must have had rank originally to enjoy the position of leadership. No matter, however, what their rank may have been in their original homeland, they have assumed the *ariki* title in the new lands on which they settled. The early use of the *ariki* title in Rakahanga shows that the institution was known to Toa and Tapairu and was introduced by them from their island of origin. In the later development of the dual *ariki* titles and the tribal titles, the names used indicate a local development and that the people were not guided in the formation of nomenclature by any memory of past tradition. The Rakahangans instituted new offices based on Polynesian principles but had to coin new local terms.

The term *ariki* was regarded as a *taohanga* (title). Toa was a warrior, as his name implies, and as Gill (10, vol. 2, p. 281) records. Toa himself may have had no title, but his wife, from her name, Tapairu, was evidently of high rank. The establishment of the *ariki* title dates from Toa's second family. The title-holders are shown in capitals in Table 5.

Table 5. Single Ariki Title Holders



Haumata-tua in Table 2 gives a different family of male children to Nanamu and derives Te-pori-o-kaivai and his brothers from Naunau, who is given as the youngest daughter. If correct, they were passed over for some reason and the title went to the sons of the youngest daughter. Of these, Te-pori-o-kaivai was the first-born, but he disappeared from the story and left no issue. Kairenga held that the title went first to the second son, Matangaro, and that his descendants were *hui ariki* (of the assembly of *ariki*) until the period of Kanohi, a female in the 10th generation. The title then passed to the Hukutahu line upon Kanohi's marriage to Tautape, a high chief of that line. The majority, however, state that the title went primarily to Huku-tahu, a younger brother of Matangaro. It is not clear why it should have passed to a junior. It was held that his grandmother, Tapairu, named him for the position. Tapairu's influence probably came from her supposed descent from Hiro and from the fact that she was a sister of the discoverer of the land. She was probably of higher rank than her husband, and the title may have been instituted from her side of the family. The phrase used to confirm Huku-tahu's appointment runs, "Te

kapi o te hui ariki kei a Huku-tahu, kei a ia hoki te pohatu." (The male issue of the *ariki* was with Huku-tahu, as he also had the symbol of office.)

The term *pohatu* (stone) was used to designate the symbol of office. Nothing is known of a stone symbol of office, but the term was at least used metaphorically. The *ariki* had priestly as well as chiefly duties.

In the 4th generation the title was held by Rua. Kairenga held that this was Rua-ariki, the son of Matangaro. The majority held that the second *ariki* was Rua-a-makoha, the elder son of Huku-tahu. He went on an expedition to Hawaiki and never returned. Some of the witnesses at the Land Court held that Hawaiki was New Zealand, but others referred to Rua as having gone to Tokelau. Rua left word that he would send back some sign if he arrived safely at Hawaiki. Some time after Rua's departure, a shoal of fish named *marau-awa* appeared, and the people, accepting them as the promised sign, refer to them as the excrement of Rua (Tutae-o-Rua).

Rua left no issue, so the title passed to the son of his younger brother, Kakahi. The *ariki* of the 5th generation had two names, Huku-tahu-rourou-a-whara and Tapu-mahanga. He had two wives. By the first wife he had a son named Kaitapu and by the second wife a son named Huku-potiki. The title passed to Kaitapu, who had the *pohatu,* but the powerful family of the second wife brought such influence to bear that Huku-potiki was given the office of attending to the distribution of land among the families. The office was termed *tuha-whenua* (land distributor), and Huku-potiki received special grants of land to go with his office, Paerangi in Rakahanga and Haroi in Manihiki. Huku-potiki was also entitled to the *mata kairau,* a contribution of food from the people in recognition of his rank. Thus the first division of authority is said to come from the two *puna* (families) of Huku-tahu-rourou-a-whara. This was the period in which the Hukutahu group was dividing into two subgroups which formed the bases of two tribes.

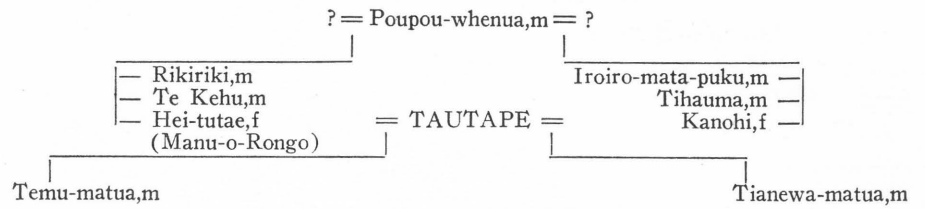
From the period of Kaitapu in the 6th generation there follows a list of four *ariki,* Nikai-patu, Touiho, Te Renga, and Tautape. According to Gill (13, p. 144) the name of Ruare-tapu comes before Tautape. These names are placed in brackets in the lineal line because it is not certain whether or not they are father and son. As the column on the right gives Niho-tapu as Tautape's father, the *ariki* who immediately preceded Tautape, whether it was Te Renga or Ruare-tapu, could not have been his father. This raises the problem of how Tautape became *ariki* when his male line of descent is evidently derived from the junior line of Huku-potiki in the 6th generation. It may have been that Tautape's mother belonged to the senior line in which male issue failed after Ruare-tapu. It will be noted that in the middle column of Table 5, if the doubtful Ruare-tapu is left out, Tautape coincides with the 10th generation, which is the same as that of his two wives,

Heitutae and Kanohi, who are descended from Matangaro. His lineal descent, however, through Huku-potiki, is 4 generations longer. This makes a considerable difference in time if calculated in generations. However, it was stated that Niho-tapu, father of Tautape, and Poupou-whenua, father of the girls who married Tautape, were contemporaries. Thus the difference of 4 generations may be due to earlier marriages on the longer line or lapses of memory on the part of genealogists. For the purposes of following out the titles, Tautape will be regarded as living in the 10th generation.

Tautape is also known as Rahui-ariki, and some genealogists confuse him with Temu. The middle and right columns in Table 5 show the descent from the two families of Huku-tahu-rourou-a-whara, among whom the power was divided. The senior line of Matangaro, in the left column, joins the Huku-tahu-rourou-a-whara line through the two daughters by different wives of Poupou-whenua. Both daughters married Tautape. As a result of this double marriage a further rearrangement was made in social structure. Tautape was the last of the *ariki* to rule singly over the people. If Ruare-tapu is counted, there were nine *ariki* who held the single *pohatu* from Haku-tahu to Tautape. The number of generations, if taken on the shorter side, indicates that the period of the single *ariki* occupied from 250 to 300 years, roughly.

By the time of Tautape the population had increased (*kua tupu te kura tangata*) and aggregations of one blood (*kura toto*) had begun to develop into separate family groups. The individual households within the same group had, in turn, built their houses around the group nucleus within the common village. When a group moved out to secure more room for expansion, all the individual members linked together by a more recent blood tie (*kura toto*) moved and built their homes in proximity to each other. This expansion with the establishment of extra households is referred to in the phrase, "Kua tere te tangata me tona nani." (People moved with their households.) Here *nani* is the equivalent of *kainga* (household) in other dialects. All the elements were present for a quarrel between the descendants of Matangaro and those of Huku-tahu, unless some arrangement was arrived at whereby the increased descendants of Matangaro could be pacified and given an active share in the government.

The head of the Matangaro stock at this period appears to have been Poupou-whenua, who is shown in the ninth generation in the Matangaro line in Table 5. Poupou-whenua had two wives, by each of whom he had a family of three children. A daughter from each family was united in marriage to the *ariki* Tautape, and in this way the two divisions descended from Matangaro and Huku-tahu came together. What subsequently transpired is as follows:



The descent of the two wives of Poupou-whenua could not be traced, but it seems probable from what transpired that the mother of Heitutae came of Matangaro stock and the mother of Kanohi of Huku-tahu stock. The reason for this statement is that in quarrels over succession to a title it is usually the families of the respective mothers of two heirs who create the trouble which ensues. Heitutae had a first-born son, Temu-matua, and Kanohi had a first-born son, Tianewa-matua. Under normal circumstances the son of the first wife should have succeeded to the title. On the death of Tautape, however, complications came up as to the succession. Though both Temu-matua and Tianewa-matua were descended from Matangaro through the maternal grandfather, Poupou-whenua, a single title would have left the power with the Huku-tahu stock through their father, Tautape. It is evident that the Matangaro stock wanted direct representation through Temu-matua, which makes me think that his mother, Heitutae, was of Matangaro stock on her mother's side as well as on her father's. The other claimant to succession, Tianewa-matua, was associated with the Huku-tahu stock which had become divided into the two groupings known as Nu-matua and Tia-ngaro-tonga. If Kanohi, mother of Tianewa-matua, was of Huku-tahu descent on her mother's side, all the elements were present for the factional division of the Matangaro and Huku-tahu people, each faction demanding the succession of its respective close blood kinsman. It must have required strong expression of divided opinion to bring about the change in social organization which occurred. The opposing factions were pacified by a compromise, for the native historians state that in the period of Temu-matua and Tianewa-matua the authority (*pohatu*) was divided (*I to raua tuatau i ngaha te pohatu*). The compromise was the creation of a dual *ariki*ship. Temu-matua was made an *ariki* and was the first to hold the *Whainga-aitu* title. Tianewa-matua was made an *ariki* and was the first to hold the *Whakaheo* title.

The people also divided into four tribes, and two tribes supported each title. The old tribes, Numatua and Tia-ngaro-tonga, upheld the *Whakaheo* title. Two newly-created tribes, Heahiro and Mokopuwai, banded together under the leadership of the *Whainga-aitu*. The native historians state, "Ko Heitutae e Poupou-whenua, ko te tumu ia o Mokopuwai." (Heitutae and

Poupou-whenua, they were the foundation of the Mokopuwai tribe.) The younger brothers of Temu-matua became heads of subtribes in the Heahiro tribe. Thus the descendants of Matangaro supported their own direct representative in the person of the *Whainga-aitu,* and the descendants of Hukutahu supported the continuation of the old single title under the new *Whakaheo.* The lands in both Rakahanga and Manihiki became divided among the tribes. The dual *ariki* ruled over their respective tribes, with evidently no serious friction, as there are no traditional records of local wars. The *ariki* were supported by their *hui rangatira* (assembly of chiefs), which included the special officers dealing with land and food, and the heads of subtribes. There was some differentiation in the powers of the two *ariki.* (See p. 210.) The dual *ariki*ship existed down to the advent of Christianity, when the offices gradually fell into abeyance owing to changed conditions affecting the social structure of the people.

Lists of the successive holders of the two titles were obtained. Of the *Whakaheo,* eleven title-holders are listed from the time of Tianewa-matua to the last holder, Iese, who was alive in 1898. Of the *Whainga-aitu,* fourteen held office from the inauguration of the title to Tupou-aporo, the last holder. It is not clear whether the earlier names in the list are direct successions of fathers and sons, but the pedigrees of later members of both titles will be referred to to throw light on the question of succession. It may be said, however, that the period of the dual titles extended over more than 200 years.

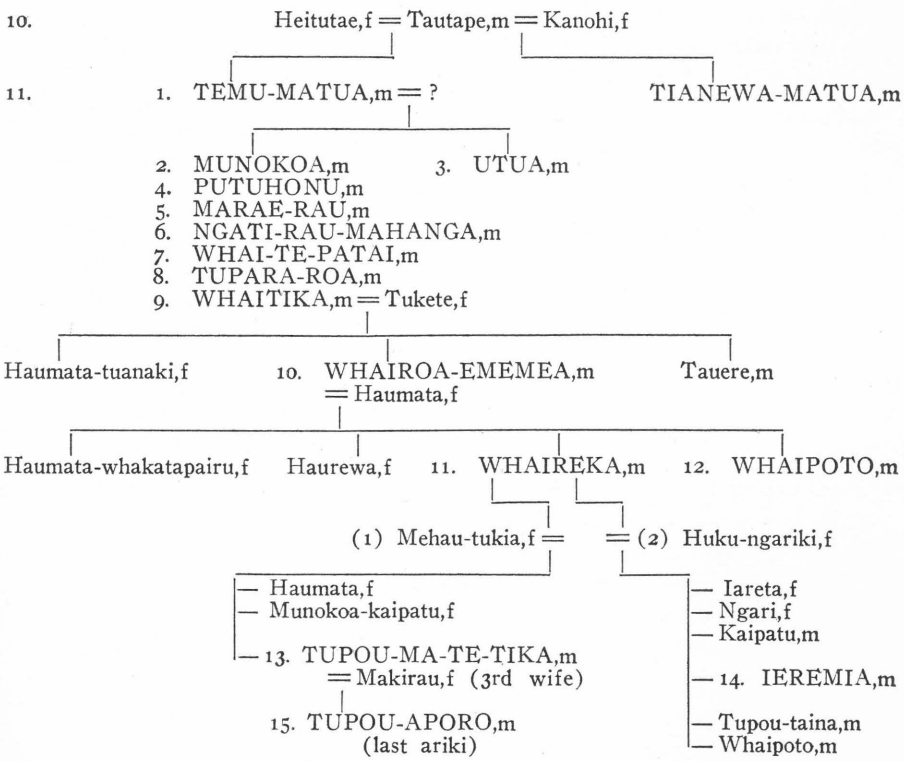
The Whainga-aitu Ariki

The *Whainga-aitu* title was a full *ariki* title, but the special term must have been developed locally, for it does not appear, so far as I know, in any other part of Polynesia. The term is said to be derived from the words *whai* (to follow), *nga* (the), and *aitu* (gods). The title thus stresses the priestly functions of the office, for the *Whainga-aitu* was the principal medium between his people and the gods. The word *whai* has been translated "to follow," but it seems to carry the additional meaning conveyed by the Tongarevan word "hai" which means to recite in the religious inclosures ritual whereby the gods are placated and success is assured. Thus the phrase, "kua whai i to ratou atua," does not mean so much "to follow," as that "they had conducted the regular ritual to their god." Of the powers of the *Whainga-aitu* it was stated, "Te Whainga-aitu nona te papa." (The *Whainga-aitu,* his was the lower stratum.) The *papa* is here translated as the lower stratum because it includes the sea as well as the land. The *Whainga-aitu* had powers over things terrestrial, as opposed to things celestial. He was supposed to concern himself with the welfare of the land and the

food growing thereon, as well as with promoting the food-productivity of the sea. He ruled over the two tribes, Heahiro and Mokopuwai, but did not interfere in the sharing out of land, which was left to the tribal heads, or *whakamaru*. The *Whainga-aitu* was the spiritual head and could command the assistance of the supernormal powers that commanded the productivity of land and sea. The *whakamaru* were the executives who superintended economic details.

The list of *Whainga-aitu* from Temu-matua is given in Table 6.

Table 6. The Whainga-aitu Title Holders



The list shows 15 title-holders, but Mr. Savage, in a table compiled for me, omits Munokoa, Utua, and Putuhonu and makes the next holder of the title Maraerau, a son of the first *ariki,* Temu-matua, by a wife named Teraro-puka. In evidence given before the Court, Haumata-tua gave Munokoa and Utua as sons of Temu-matua and title-holders. The relationship of Putuhonu was not given. From Putuhonu to Whaitika the names follow

as a list, but from Whaitika the pedigrees are given. The pedigrees illustrate the rules governing succession to the title, which eliminated female succession and considered male seniority.

The 9th holder, Whaitika, had three children. The first-born was a female, so succession went to the senior male child, Whairoa-enemea. The 10th holder, Whairoa-enemea, had four children, but as the first two were females, the title went to the third child, Whaireka. Whaireka, the 11th holder, had two families, but as his younger brother, Whaipoto, appears on the list as the 12th title-holder, Whaireka must have died before his children were old enough to hold office. Whaipoto would thus have succeeded as a regent until the heir of the senior line was old enough to assume office. The title went to the family of Whaireki's first wife, of which the first two were females. The third child, a son named Tupou-ma-te-tika, succeeded as the 13th holder. He had three wives. The first wife had one daughter, and the second wife had five daughters. Neither had a son. The succession therefore passed to the family of the third wife, Makirau, who had a son named Tupou-aporo. Before Tupou-aporo was old enough to assume office, his father died. The privilege of maintaining the position was thereupon assumed by Whaireka's second family, and Ieremia acted as regent for ten years. Tupou-aporo and Ieremia really acted together, and at the end of ten years Tupou-aporo, having reached man's estate, took over full control of the office. Ieremia objected, but as he was not supported by the families concerned, he left the island.

A story in connection with the first *Whainga-aitu,* Temu-matua, illustrates the connection between the temporal and religious sides of the office. Temu-matua was a weakly child, so his maternal uncle, Rikiriki, was sent for. Rikiriki was the male representative of the Matangaro stock, which again shows how the Matangaro division had concentrated attention on Temu-matua as their particular representative in the *ariki* families of his father, Tautape. Rikiriki took the child before the god Hikahara. The child recovered health. Some time afterwards, Rikiriki built a voyaging canoe (*kua tuki pahi*) with the object of visiting foreign lands (*heaheake*). He selected his party (*tere*), which included his nephew, Temu-matua, and went through the appropriate ritual before the god Hikahara to insure success (*kua hakairo ia ratou i mua i taua atua*). On the date of departure from Tauhunu in Manihiki they sang a song (*pehe*) in the channel or lagoon at Awanui. The tribe then realized that Rikiriki was taking the boy away with him on his travels, so the people begged him to allow the boy ashore that they might press noses (*hohongi*) with him in farewell.

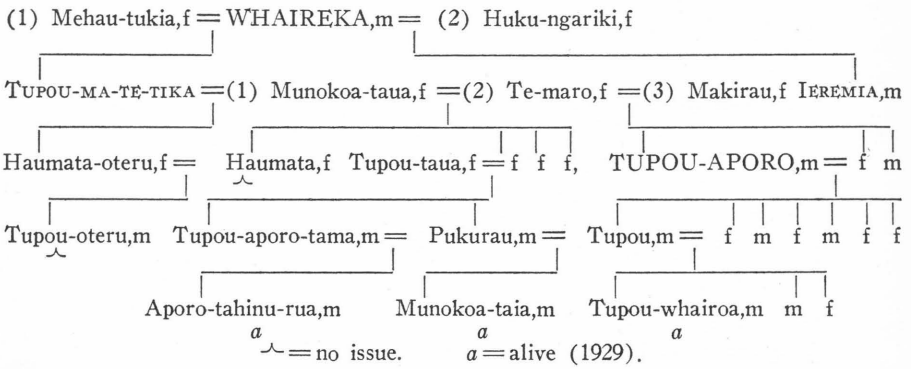
This story has a significant bearing on the creation of the *Whainga-*

aitu title. The Polynesian historians have a habit, at times, of telling a straight narrative of a historical incident instead of discussing the details of the origin of an institution. Rikiriki was the eldest brother of Hei-tutae and the eldest son of Poupou-whenua's first wife. (See p. 47.) He was therefore head of the strong Matangaro group, and he cured his nephew Temu-matua. That he had prepared to go on a voyage to other lands and take his nephew with him shows that the dual *ariki*ship had not been established at that time. It is probable that the ambition Rikiriki may have entertained for his nephew had not received sufficient whole-hearted support to result in tribal action. The intended voyage, therefore, may have been due to spleen. The singing of the song in the channel drew full attention to the voyaging canoe. When it was perceived that Temu-matua was on board, the two Matangaro tribes realized that they were about to lose him. They were galvanized into action then by the imminence of a disaster. They begged that the boy be allowed ashore that they might press noses with him in farewell. The historian states that, on getting him ashore, "*Kua tohi te matakeinanga.*" The *matakeinanga* is the large group or tribe, and the tribe evidently went through a ceremony termed *tohi* in order to detain Temu-matua. Rikiriki, seeing what was happening, called out, "Ka tohi kotou, ono reka iho. Kua whakairo au i taua tamaiti ki te atua." (You are doing the *tohi,* he may remain. I have, however, already dedicated that boy to the god.) I did not get the full meaning of *tohi* in Rakahanga. In New Zealand *tohi* refers to ceremony performed over a new-born infant or over adults on certain occasions to make them successful. The *tohi* over Temu-matua was undoubtedly a ceremony proclaiming him high chief over the Matangaro *matakeinanga,* and so making it impossible for him to leave. Rikiriki had probably achieved what he desired, to establish Temu-matua, and he volunteered the further information that the child was already in close connection with the god and so fitted for his position.

At this time the two Matangaro tribes, Heahiro and Mokopuwai, were affected by a serious sickness (*uiha*). No one had been able to relieve (*tunoko*) them. The tribes, as shown by the story, were living on Tauhunu. Temu-matua then devised a plan for alleviating their distress. He went to the island of Te Puka and sought out a coconut that grew singly on one flower stalk. This nut (*tautahi*) he took, with some *puraka,* to Tukou as an offering to the god Hikahara. The disease thereupon cleared up (*moki*). This incident established the custom of traveling from Tauhunu to Tukou via Te Puka. The marked success of Temu-matua proved that he had power with the god and confirmed his authority. He became *kana* or *tutara* to the gods, or in other words, he became priest as well as *ariki.*

Table 7 gives the pedigree of the three families of Tupou-ma-te-tika in full to show the manner in which succession passes over female issue.

Table 7. Manner in which Succession Passes over Female Issue



THE WHAKAHEO ARIKI

The term *Whakaheo* is said to be derived from *waka* (canoe) and *heo* (to surround). In the voyages made by the whole population between the two atolls, the *ariki* holding the title surrounded the canoes with his priestly and supernormal powers and thus insured safe transport. The *ariki* was therefore termed originally the "waka-heo." In the course of time *waka* (canoe) became changed to *whaka* (the causative prefix), but the title of *whakaheo* has not changed materially in meaning. It now means "to cause to surround with priestly influence," and its original application to the voyaging canoes is understood. Of the powers of the position it is said, "Te Whaka-heo, nona te tira." (The Whaka-heo, his is the *tira*.) The *tira* is in contradistinction to the *papa* of the *Whainga-aitu*. Just as the *papa* refers to things terrestrial, so the *tira* refers to things celestial. The *Whakaheo* had power over the phenomena of nature. He could demonstrate his power by causing the lightning to flash, the thunder to sound, and the rain to fall. He thus controlled the winds and storms, and it was through this power that he was able to surround the voyaging canoes with his priestly protection and insure a safe passage between the atolls.

The *Whakaheo* trace their descent through Tianewa-matua, the first of the dual *ariki* who represented the Huku-tahu division of the people. Under his *ariki*ship were the two tribes, Nu-matua and Tia-ngaro-tonga. Patrilineal descent and seniority decided succession to the title, and women could not succeed to it. The list of title-holders is given in Table 8.

Table 8. The Whakaheo Title Holders

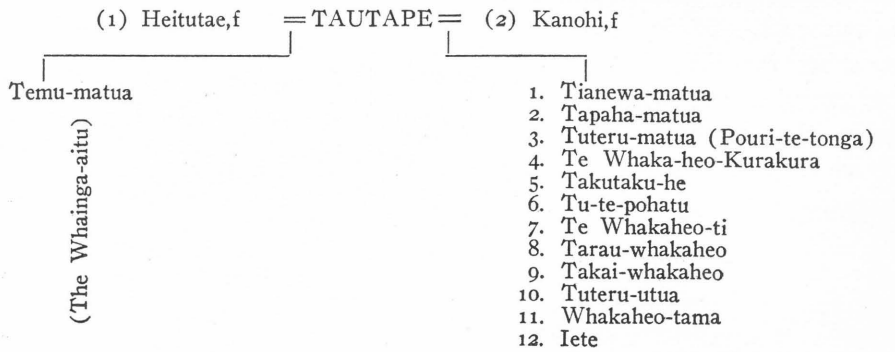
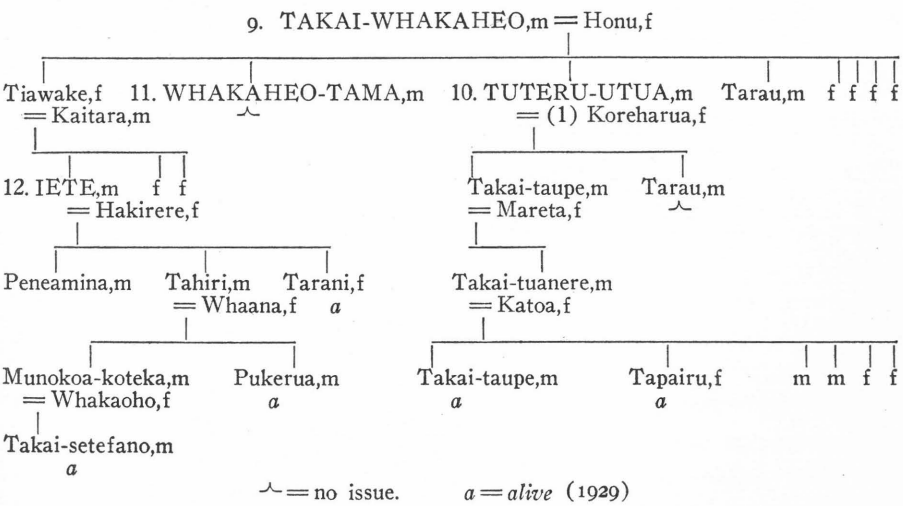


Table 8 is only a list, for the exact pedigrees from Tapaha-matua (2) to Takai-whakaheo (9) could not be obtained. It was assumed that sons followed fathers throughout, but this is not certain. A detailed pedigree from Takai-whakaheo which throws further light on the complications that sometimes arise with regard to succession was obtained. (See Table 9.) Christianity entered the atolls in 1849, and in this year Takai-whakeheo (9) was holding the title. Iete was alive in 1898.

Table 9. Succession to Takai-whakaheo



Takai-whakaheo (9) had a family of eight, the first child a daughter. Three sons followed. The senior son, Whakaheo-tama, went to Malden Island. During his absence his father died, and the next son in seniority,

Tuteru-utua (10), who was on the spot, was raised to the title. When Whakaheo-tama (11) returned from Malden Island seniority asserted itself, and he was made *ariki* in place of his younger brother. Tuteru-utua, having had to relinquish office, left the country and went to Tonga. Later, he returned and settled down. Both Tuteru-utua and the younger brother, Tarau, died before Whakaheo-tama, the title-holder. Whakaheo-tama had no children of his own, but he adopted Takai-taupe, the eldest son of his younger brother, Tuteru-utua. Whakaheo-tama is stated to have wished to confer his title on Tairi-orometua, the native missionary who came from Rarotonga to spread the gospel in 1849. Tairi rightly refused the honor. On the death of Whakaheo-tama, however, Tairi used the strong missionary influence that existed, and the title passed to Iete (12), the son of Whakaheo-tama's elder sister. Had either Tuteru-utua or his younger brother, Tarau, survived, the title would undoubtedly have gone to them. Under the circumstances the rightful heir according to the laws of succession was Takai-taupe, the son of Tuteru-utua, who had been adopted by Whakaheo-tama. Probably Iete was an elder of the church, but certain it is that missionary influence interfered, and succession took place through an elder sister's line. The title ended with Iete. Had the title continued, it would have been interesting to learn whether it would have continued down the Iete line or returned to the Tuteru-utua line.

Other Titles

It was held that each *ariki* had his *hui rangatira* (assembly of chiefs). The term *hui rangatira* is a Rarotongan one which includes the heads of families who are closely related to the ruling *ariki.* It is probable that the term was adopted from Rarotonga but that the principle involved was in force. Thus, the younger brothers and paternal uncles of the *ariki* were of high rank and would be closely associated with the official head of the family who held the title. Associated with the *ariki* were certain chiefs who had to deal with the economic details within the tribes. We have seen that the special office of *tuha whenua* was given to Huku-potiki in the 6th generation. When the spread of population resulted in family groups or tribes, the heads of the tribes functioned as *tuha whenua,* but the special title, *whakamaru,* was evolved. The *tuha-whenua* title that was instituted in the 6th generation became merged in one of the *whakamaru* titles that were evolved about the 11th generation.

Whakamaru was the local *taohanga* (title) given to the heads of tribes. It corresponds to the Rarotongan title, *mata(h)iapo,* which was not known in the atolls until after the introduction of Christianity. *Whakamaru* (to give shelter or shade) is thus an expressive term, as the head of the tribe

ought to shelter his people. According to some informants, there were two *whakamaru* under each of the dual *ariki*, thus making one representative for each of the four tribes. Others seemed to think that the heads of subtribes were also *whakamaru*. Some of the subtribes must have been fairly small in number, and it is hardly likely that the term would have been applied to the heads of many subtribes. It was stated that on the death of a *whakamaru*, his relatives (*huanga*) elected (*mono*) his successor. Others held that the *whakamaru* was elected by the subtribes, as he had power over their lands. It is unfortunate that no tribe was able to give a list of its *whakamaru*. No check data are available for pedigrees to indicate on what principles the *whakamaru* was really appointed. It is to be presumed, however, that the *whakamaru* was appointed by succession in the male line from the leading family in each group. Relatives and heads of subtribes probably met to discuss the pedigree and ratify the election of the person who was entitled by birth to succeed.

The duties of the *whakamaru* were to act as public custodian over tribal lands, to settle disputes, and to prevent outside interference from another tribe. He had to do with directing the planting of food crops and the protection of the coconut plantations and *puraka* swamps from theft. He had power also over the redistribution of tribal lands which had to be adjusted to the ebb and flow of population. His decision was final, and not even his *ariki* could interfere with him in matters that concerned the interior economy of the tribe. His status was as high or even higher than that of the *ariki* in local matters. When it came to questions which concerned the intervention of the tribal gods, however, the *ariki* was superior, owing to his special priestly functions. From a modern point of view, the *whakamaru* in his own tribal district was judge of the native land court, Crown ranger, and director of agriculture. He also had a priestly function. When the whole population crossed from one atoll to the other the *whakamaru* from the tribes went first to the marae to conduct the appropriate ritual to the god (*ka whai i to ratou atua*). It was also stated that certain lesser tribal gods were in the keeping of the *whakamaru*.

The *moa* was a speaker or messenger between the *whakamaru* and the *ariki*. He was a *whakamaru* appointed by *whakamaru*. In discussions among the *whakamaru* he assumed seniority, and his decision was final. The title-holder seemed to be associated particularly with the *Whainga-aitu*.

The *tira* was an honorific title applied to the *Whakaheo* on account of his supernormal powers in dealing with natural phenomena. He was the astronomer who studied the heavens with regard to star signs of the seasons and the advent of winds.

The *papa* was a special title held by one Tuteru-te-tahua. He dealt with economic matters with which the *ariki,* by virtue of his priestly position, was not allowed to concern himself. He thus controlled land and food supplies. He had power with the *Whainga-aitu* division through his father and power with the *Whakaheo* division through his mother. He could thus conduct the religious ritual at the Poutu marae at Tauhunu and at the Akaroa marae at Tukou. He probably was a super *whakamaru* who by birth and ability carried influence with the *whakamaru* of the four tribes.

It has been pointed out that a woman could not succeed to an *ariki* title even when she was the first-born child of an *ariki* by his first wife. This rule held in the Cook Islands, but was broken after the advent of Christianity. In Manihiki and Rakahanga it was observed until the extinction of the titles. The first-born females of the *ariki* lines, however, had a high status. They received personal names which became established as set names for those born in that line. The eldest daughters of the *Whainga-aitu* were named Haumata, and the eldest daughters of the *Whakaheo* were named Takai. Toa's wife was named Tapairu-taki-hetu. The first part of the name, Tapairu, means, in the Cook Islands, a first-born female. This meaning of the word was evidently carried on in the memory of Tapairu's descendants, for the special title, *whaka-tapairu,* was given to the first-born daughters of the *ariki.* By receiving special titles of dignity, the first-born daughters were effectively eliminated from any possibility of succeeding to the male *ariki* title, "Kare te wahine i te taohanga ariki, ka noho ratou i te taohanga whaka-tapairu." (Women could not occupy the *ariki* title, they remained with the title of *whakatapairu.*) The first-born daughter of the *Whainga-aitu* was thus named Haumata-whakatapairu and that of the *Whakaheo,* Takai-whaka-tapairu. The prefix *whaka* is causative and carries the idea that the bearers of the titles had been made *tapairu* or first-born.

The *whakatapairu* had certain privileges and performed certain functions connected with the title. Thus, after the *whakamaru* chiefs had visited the marae on landing at one of the atolls, they returned to the canoes. The *whakatapairu* then visited the marae in turn to perform their duties, and only after that could the people leave the beach and explore the land. The details of what they did on the marae are not clear.

The *Takai-whakatapairu* had special powers to calm the sea. If the sea was rough during a bad season when food was low, the *whakatapairu* went out to the reef and beat upon the waters of the lagoon and the reef channel with a coconut leaf. At the same time she recited a chant (*pehe*). Her action caused the seas to subside and enabled the men to go fishing. Her power (*mana*) was derived from her position as direct representative of the *Whakaheo* who possessed the *tira,* or power over natural phenomena.

TRIBAL HISTORY

First Divisions

Rakahanga affords the unique example of the development of an insular population from one biological family. Its isolation and sea-girt bounds presumably prevented the intrusion of foreign elements. The blood tie was apparently realized to such a degree that no internecine wars broke out. The people developed for about nine or ten generations in one village on one island in peace and harmony.

The absence of descriptive words in the relationship terminology must not be regarded as an indication that degrees of remoteness in kinship were not recognized. When crowding of population took place, some households moved away to obtain more space. The households that were close of kin accompanied them to the new center instead of remaining in proximity with people remote in blood. Thus the very feeling of close consanguinity that led family groups to establish themselves close together, by removal from the vicinity of other families gave expression also to the recognition of remote degrees of blood relationship. Upon this principle family groups have been segregated, have developed into tribes, and have later automatically divided into subtribes.

The budding off of the families (*puna*) took place on the one small island, Te Kainga. Kainga means "home," or the place where people dwell. In the course of time the original household developed into a village, but the village was automatically divided into separate groupings that claimed common blood kinship from more recent ancestors. The island of Te Kainga became established as the island of occupation, whereas all the other islands were reserved for the production of food. The regular passages back and forth to Manihiki were later established, though food considerations and the establishment of two villages in Manihiki were the result of the still later development of tribes and a dual *ariki*ship.

Tradition shows that the families in the first few generations arranged themselves into two groupings according to their descent from the two brothers, Matangaro and Hukutahu. This dual grouping was rendered the more conscious because the *ariki* title descended in the Hukutahu family. The Matangaro families built their habitations on the sea side of the island, and the Hukutahu families took the inland lagoon side. In each generation families of close consanguinity naturally built their dwellings in proximity to each other. Occupation of particular localities led to the establishment of the rights of ownership to the particular portion of land on which the dwellings were built, and the theoretical division into two groups according to pedigree was thus carried into practice in the grouping of habitations. The

factors which led to the crossing of the group boundaries were marriage and adoption. Wives went to live in their husbands' habitations in their group localities, and conversely, younger brothers sometimes went to live with their wives' relatives. A brother or a father might adopt a sister's or a daughter's child, who otherwise would have remained with the group of the child's blood father.

The automatic grouping took place in each of the two divisions. In each generation, while new families were created with their respective degrees of closeness, the existing degrees of remoteness were rendered another step more remote. Thus, if the Hukutahu families had been examined in the 5th generation, it would have been found that the families at one end of the territory allotted to them were of closer kin to each other than they were to the families at the other end. Somewhere between them there was a potential line of cleavage which became intensified with each succeeding generation. In the 5th generation the *ariki* Hukutahu-rourou-a-whara married two wives. The tendency to split is exemplified by the division of power between the eldest sons of the two wives. Kaitapu, the son of the first wife, retained the *ariki* title. All the families connected by close kinship to his mother formed a closer group around Kaitapu. Huku-potiki, the son of the second wife, became the land distributor, and all the families closely related to his mother formed another group around Huku-potiki. This secondary grouping within the Hukutahu group was simple, because evidently both mothers were from within the Hukutahu group. The automatic grouping or arrangement within a recognized larger group is unconscious until growth of population or the ambition of families makes the secondary grouping so conscious that it leads to a definite cleavage of the main group. Thus the establishment of two titles or offices led to the commencement of conscious grouping within the Hukutahu group. By the time the 10th generation was reached, the cleavage had become so definite that the original Hukutahu group had split into two groups which received the specific names, Nu-matua and Tia-ngaro-tonga. The formation of two definite groups with distinctive names led to the abandonment of the Hukutahu classification, but it was known that these two organized groups had descended from Hukutahu. The two groups continued to dwell on the lagoon side of the village that had grown up, and, owing to the method of budding off, each group occupied its own definite area.

A similar process had taken place in the Matangaro group, but the Matangaro people had no special titles or offices which might serve to accentuate a conscious cleavage in the earlier stages of growth. In the 11th generation, however, the tendency to segregate was brought to a head through the two families of the *ariki* Tautape. The native historians state that the

old group of Nu-matua and Tia-ngaro-tonga ranged to the support of one of the sons of Tautape named Tianewa-matua. This was a carrying on of the support that they had always rendered to the *ariki* line, which came from within themselves. The Matangaro group, however, became attached to Temu-matua, the son of Tautape's other wife. Spurred to action by the fear of losing Temu-matua through the proposed voyage with his maternal uncle, Rikiriki, they kept him by making him head over their group. As the historians say, the Matangaro people formed the new groups (*mata-keinanga*) of Heahiro and Mokopuwai to support Temu-matua. This created a dual *ariki*ship with two groups supporting each *ariki.* From the statement regarding new tribes, it would appear that the two Hukutahu groups had been named some time before but that the circumstances surrounding the creation of the second *ariki* led to the definite naming of the two groups into which the Matangaro people divided.

The scattered habitations had by this time fused into a large village on Te Kainga, in which the population lived close together (*piri te tangata*). The division between the four groups was maintained in the arrangement within the village. A boundary stone (*tuakoi*; Rarotongan, *kena*) had been erected in the middle of the village to mark the boundary between the two original groups. It still remains in its original position and consists of a wide coral slab standing about 4 feet above ground. The two groups on either side of the boundary had automatically erected their dwellings in group clusters. The native phrase "ka tere te tangata e tona nani" (the individual went with his household) indicates the process already described. In the more complicated arrangement of a closely settled village, the leaders of the groups set up boundaries between the four groups and later between the subgroups which subsequently developed.

In the 11th generation, therefore, the population had organized into four named groups (*matakeinanga*) which for the purposes of this study may be regarded as tribes.

The Tribe

The term "tribe" is usually applied to a fairly large number of people who occupy a territory defined by boundaries, speak a common language or dialect, are governed by one head, and share a common culture. This definition would cover all the inhabitants of Rakahanga and Manihiki. The four *matakeinanga* speak a common dialect of the Polynesian language. They originally had one common *ariki,* but the creation of a dual *ariki*ship broke this unity. The general culture is identical, but there are differences with regard to leadership and the worship of gods. Furthermore, the land in the two atolls was definitely divided among the four *matakeinanga.*

The term *matakeinanga,* in Mangaia, means a group of kinsmen, but evidently it was not in use as a tribal term. In Rakahanga the basic meaning of the term was similar to that in Mangaia, but when the four groups of kinsmen were distinguished by individual names these named groups were definitely referred to as four *matakeinanga* (*e ha matakeinanga*).

Each *matakeinanga* elected its head independently of the others. The special term *whakamaru* was coined to distinguish him. His powers have been defined. For practical purposes, the *matakeinanga* was a small tribe, independent of the others as regards local government, but uniting with another *matakeinanga* under the two priestly *ariki* for religious purposes. All four *matakeinanga* federated for voyages back and forth between Manihiki and Rakahanga. The *matakeinanga* might have been regarded as subtribes were it not that each of them split into named subdivisions to which the term subtribe is better applied.

The naming of the tribes creates a problem. In Tongareva, owing to the spread of secondary centers of habitation, the groups which grew up were designated by the territorial name of the island they occupied. In Rakahanga, as the whole population lived on one island and not in territories, the territorial designation of groups was not applicable. Under such circumstances, a group designation conveying descent from a common ancestor might be expected. In New Zealand and other areas, tribes are commonly designated by the application of a plural prefix to the name of an eponymous ancestor. Latent in the four Rakahangan tribal names, Numatua, Tia-ngarotonga, Heahiro, and Mokopuwai, is a possibility of derivation from ancestral names, but the people themselves were unable to settle the difficulty by locating the eponymous ancestors, if such they were, on their family pedigrees. Nu-matua looks like a personal name but does not appear in the pedigrees. Ngarotonga appears in the 5th generation (p. 26) as a grandson of Matangaro, but the Tia-ngarotonga is a Hukutahu tribe. Haumata-tua stated that Heitutae and Poupou-whenua were the stock through which the Mokopu-ngarotonga descended, and that Poupou-whenua, the father of Heitutae, was of Matangaro stock. This will bring in the name Ngarotonga as an eponymous ancestor, but when I pointed out that the Tia-ngarotonga tribe was not of Matangaro descent, the reply was given that Mokopu-ngarotonga did not refer to the Tia-ngarotonga but to the Mokopuwai, which is of Matangaro stock. No explanation was offered as to the Heahiro tribe. It is probable that the tribal names are derived from ancestors who lived between the 5th and 9th generations, but the imperfect transmission of the pedigrees prevents illustration of this.

Subtribes

After the 11th generation, when the four tribes were established in name, a further subdivision took place within each of the tribes. These smaller groups were termed *tukuwhare,* which is again a local term coined to meet the local development. In the term *tukuwhare, whare* means a house, and the idea is conveyed of the kinsmen of the one *matakeinanga* being grouped together in separate houses. The two *Whainga-aitu* tribes were divided into seven and four subtribes respectively (Table 10).

Table 10. The Whainga-aitu Tribes and Subtribes

Matakeinanga	Tukuwhare
Heahiro	1. Te-whare-ariki
	2. Kai-wai-pa-honu
	3. Po-te-noa
	4. Mau-kino
	5. Whare-nui
	6. Whati-akau
	7. Te-ure-roto
Mokopuwai	1. Hihahuke
	2. Nga-whare-ririki
	3. Taupo
	4. Tutonga

The origin of five of the seven subtribes of the Heahiro were demonstrated by Haumatatua (Table 11).

Table 11. Origin of Subtribes

10.

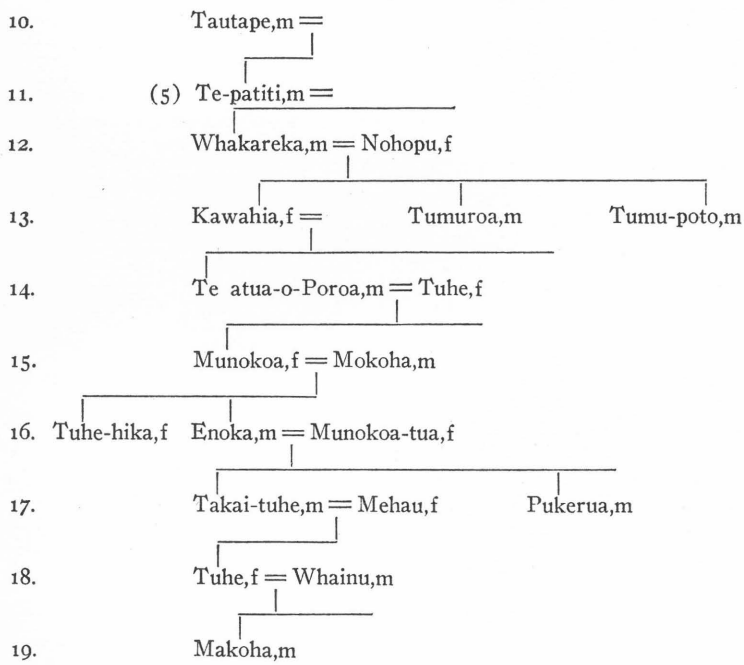
Heitutae,f = Tautape,m = Kanohi,f

— 1. Temu-matua,m	(Te-whare-ariki)	Tianewa-matua
— 2. Pa-honu,m	(Kai-wai-pa-honu)	
— 3. Te-noa,m	(Po-te-noa)	
— 4. Maukino,m	(Mau-kino)	
— 5. Te-patiti,m	(Whare-nui)	

Temu-matua and Tianewa are the first two dual *ariki.* The Heahiro and Mokopuwai tribes clustered around the family of Heitutae. By her, Tautape had five sons. The eldest son, Temu-matua, was raised by the two tribes to the position of *ariki,* and he became the first *Whainga-aitu.* Haumata-tua stated that the other sons were made heads of *tukuwhare.* Thus it is evident that minor subdivisions had already been following a natural process, but the five sons were made heads of five subdivisions in the Heahiro tribe. Succession to leading rank in those subtribes would subsequently be traced through the brothers. The group associated with

Temu-matua was named Te-whare-ariki (the house of the *ariki*) because the *ariki* title would descend in it from Temu-matua. The group associated with the second son, Pa-honu, was named after him and became Kai-wai-pa-honu, in which *kai-wai,* for some reason not explained, was prefixed to the ancestral name. Similarly, the Po-te-noa took its name from the third son by the prefix *Po* before the personal name of Te-noa. The Mau-kino subtribe took the name of the fourth son without any prefix. The fifth subtribe took the fifth son, Te-patiti, as their head but adopted the term of Te-whare-nui (the big house) for a reason not explained. Unfortunately, no clear pedigrees were furnished from these original heads of subtribes except the one from Te-patiti, shown in Table 12.

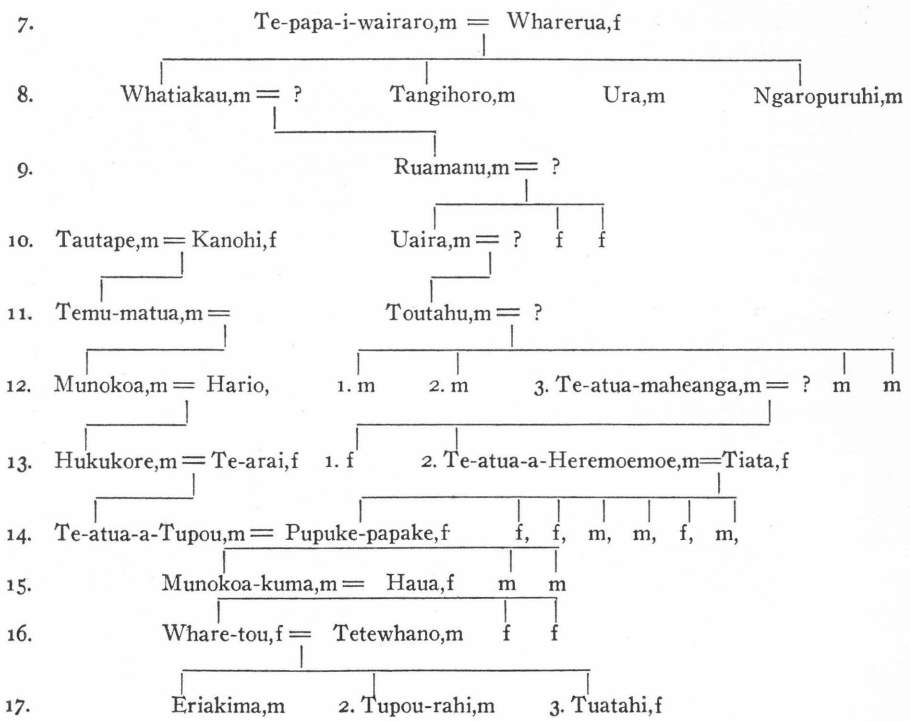
Table 12. Te-whare-nui Subtribe



The line is short. Pukerua in the 17th generation is still alive. As Te Patiti in the 11th generation was a fifth brother, the line may be expected to be shorter than those from senior sources. The line shows three females in it, and I do not know the status of the last issue in the subtribe.

The sixth subtribe of Whatiakau, according to Tupou-rahi, comes from an important ancestor named Whatiakau, from whom Tupou-rahi gave his descent (Table 13).

Table 13. Whatiakau Subtribe



Tupou-rahi could not link up the beginning of his pedigree with the main lines of descent from Toa. However, in the 14th generation Pupuke-papake married Te-atua-a-Tupou, who traced back to Tautape, the last of the single *ariki*. This places Te-papa-i-wairaro in the 7th generation. According to Tupou-rahi, Te-papa-i-wairaro was a very important man. He had four sons to whom he distributed land and authority. To the eldest son he gave the authority over his lands (*tuku te whenua kia Whatiakau*), to the second son he delegated authority over his group of people (*whaka-tere te matakeinanga kia Tangihoro*), to the third son he gave the care of the family gods (*te whare urunga kia Ura*), and to the fourth son he gave the position of herald (*te horohoro kia Ngaropuruhi*). If this is correct, Te-papa-i-wairaro must have belonged to the Matangaro group, for the Hukutahu group had already divided the authority over the people and the land between Kaitapu and Huku-potiki in the 6th generation. That the Whatiakau subtribe belongs to one of the *Whainga-aitu* tribes is a further substantiation. It will be noted that at this period there were evidently group gods which are referred to as the "whare-urunga." Evidently Ura

performed the duties subsequently delegated to the *whakamaru* who had charge of the tribal gods and kept them in a house. No details were obtained of the functions of the herald (*horohoro*) beyond that he was the official messenger between the chiefs and the people, calling people together or promulgating decisions arrived at concerning group policy and action. Tangihoro was stated to have made voyages to foreign lands and to have come back among the people. Such voyages may have been made to the neighboring atoll of Manihiki and thus paved the way for the planting of that atoll and the subsequent regular visits to alternate the food supplies. Tupou-rahi in the 17th generation is an old man, and two generations may be added to the line to bring it to about 1900. A line of 19 generations makes it coincide in length with the Wharenui line in Table 12. In Tupou-rahi's descent, his male line from Te-atua-a-Tupou (14th generation) comes from the Whare-ariki subtribe through Temu-matua (11th generation), but he claims Whatiakau descent through the female line of Pupuke-papake (14th generation). He attaches great importance to her, as she was the first-born of her family. The leading line in the subtribe should come down through one of the elder brothers of Te-atua-maheanga in the 12th generation. It will be noted that the name of the mother of Temu-matua (11th generation) is given as Kanohi, whereas in Table 6 it is given as Hei-tutae. This is another instance of the confusion that exists.

The seventh subtribe, Te-ure-roto, completes the Heahiro tribe. I am unable to give the circumstances which led to the adoption of the name.

Of the four Mokopuwai subtribes, Tupou-rahi gave a descent to himself which placed Tutonga in the 11th generation. Tutonga was thus an ancestor who lived at the period when the subtribes were formed, and his name was adopted for one of them. Of the others, Nga-whare-ririki means "the small houses" and was probably so named from the linking of a number of small families to form a subtribe. The remaining two, Hihahuke and Taupo, sound like proper names but do not occur in the pedigrees submitted to the Land Court.

The two *Whakaheo* tribes have seven subtribes (Table 14).

Table 14. The Whakaheo Tribes and Subtribes

MATAKEINANGA	TUKUWHARE
Nu-matua	1. Te-pu-tauhunu
	2. Purenga
	3. Kaupapa
	4. Hitiki
	5. Popo-iti
	6. Nga-hoe-e-wha
	7. Whati-kaua
Tia-ngaro-tonga	1. Wai-a-Matua
	2. Ngaro-Tapaha
	3. Nga-whare-ririki
	4. Tuteru-matua
	5. Tianewa-matua
	6. Tihauma
	7. Hua-tane

No details of definite pedigrees of these subtribes were obtained. It will be noted that some, such as Tuteru-matua, Tianewa-matua, and Tihauma, are definitely the names of ancestors. The Tia-ngaro-tonga tribe resembles the Mokopuwai tribe in having a subtribe called Nga-whare-ririki (the small houses). The Nu-matua tribe has a subtribe called Te-pu-tauhunu, in which *tauhunu* is a plant and *pu*, a bush. Another subtribe name, Nga-hoe-e-wha, means "the four paddles." It is thus evident that some subtribes were named after ancestors and others from incidents or things that are not clear to the present generation.

Our stay on Rakahanga was too short for us to gather all the fragments of information that might throw more light on the details of subtribal evolution. It was clear to the Native Land Court that the witnesses were hazy about linking up their pedigrees with leading lines that would connect with descent from Toa. Most started with ancestors from 6 to 8 generations back who formed independent units and were left floating in the air. Certain families supplied the leaders for the subtribes, but no connected list of tribal or subtribal leaders could be conjured up out of the mass of family pedigrees adduced before the Court. It is probable that when the Court goes into the question of land ownership on the various islands, subtribes will be associated with definite islands, and the present family pedigrees may then be more clearly arranged to show the structure of subtribes.

POPULATION AND LAND

The growing needs of the increasing population led to the planting of Manihiki with coconuts and *puraka*. When food supplies ran short on

Rakahanga, the whole population voyaged across to Manihiki to partake of the food which had been planted there. It is evident that the migrations to Manihiki took place regularly after the population had increased sufficiently to necessitate such a step. On Rakahanga, sentimental considerations probably induced the four tribes to remain in the one village of Te Kainga. All had an equal right to it, and the law making the other islands tapu for food had been enacted before the development of the four tribes. Manihiki, however, had no sentiment attached to it, so that when the four tribes went there they founded two separate villages on different islands. Each village was occupied by an *ariki* and his two tribes.

The islands were distributed among the tribes and subtribes and they planted them with coconuts. Certain parts were also excavated for the growth of the *puraka* (species of taro) in the brackish subsoil water. When the mature tubers were dug up, the tops were replanted. The tribes continued in occupation until the *puraka* and coconut supplies were depleted. They then returned to the other atoll, on which the food supplies had matured during their absence.

The distribution of land had come about by a gradual process of evolution with the growth of population. When Toa, the first settler, established his family at Te Kainga, the problem of land distribution did not obtrude itself. In the 6th generation, however, the need of defining spheres of influence had evidently become necessary, and the office of land distributor (*tuha whenua*) was given to Huku-potiki, whose elder half-brother, Kaitapu, retained the rank of *ariki*. Power over the land thus became early disassociated from the office of *ariki*. It must be assumed that successive families under their respective heads had planted in the near-by islands that they considered suitable. There was room for all and no cause for trouble, as there were no previous settlers. The creation of a specific land officer led to organized disposal of the available lands. The land distributor, taking into account the planting that had already been done, associated certain families with particular localities. Probably the heads of families threshed out their arguments in public meetings. The official land distributor had the final word, and what was decided upon by him became established. As the families developed into larger groups, which subsequently became tribes, the tribal boundaries simply included the lands of the families comprising the tribes. With the increasing complexity of social structure to meet the growth of population, the power over tribal lands passed from one individual into the hands of the tribal heads, or *whakamaru*.

The functions of the *whakamaru* with regard to land have already been defined (p. 55). He acted as public custodian over tribal lands, settled disputes within the tribe, and prevented outside interference from other tribes.

Thus the tribes had their tribal lands on both atolls, and the problems of partitions and adjustments were settled within the tribe.

Within the tribe itself, secondary groupings that resulted in subtribes also naturally led to the defining of subtribal lands within the tribal area. These subtribal problems were settled by the heads or leading families within the subtribe acting with the *whakamaru*. Within the subtribe, every individual had a right to a share of land, but the individual shares were grouped together in family holdings. The location of family shares was guided in later years by the inheritance of the areas planted by ancestors. In the beginning, however, the families were probably well-spaced in the lands that were being planted for the first time. In that period there were evidently no exact boundaries defined by equivalents of survey pegs or boundary stones. The boundaries between neighboring families were, to a certain extent, created by the spreading and meeting of the coconut trees that had been planted by successive generations. The self-planted trees that grew up naturally from the nuts that fell in an outward direction from marginal trees were claimed by the owners of the trees from which the nuts had fallen. The boundaries between neighboring family properties are thus often irregular. The evolution of irregular family boundaries is exemplified by a case that came up before Judge Ayson during our stay on Rakahanga. Two families desired a survey to define the boundary between their respective properties. As defined by the coconut trees claimed by each party, the boundary was marked by curves and projections of which the government surveyor, who naturally desired straight lines between angles, despaired. Each party claimed coconut trees that had encroached beyond the natural line. Neither would give way. A compromise was eventually made on the advice of the Court by the exchange, or even sale of trees, in order to get a satisfactory survey boundary. The fairness of the survey line with regard to the land was admitted by both, but the coconut trees were the bone of contention.

The influence of the ownership of coconut trees in establishing a right to land is shown by the case cited above. The rights to the immovable property combined in the coconut and the land on which it grows is further exemplified by the *pakewa* custom. As defined by Mr. Savage in correspondence, it is a custom under which a person with no rights to land is given

> . . . the right to the use of a certain tree or trees, that he may pick the fruit thereof and use same as refreshment in his passing over the land. This custom gave only the right to use the tree but no right whatever to the land.

The value of the *pakewa* custom will be fully appreciated by those who have experienced the heat of a tropical sun while walking over atoll islands. Out of the dual feelings of kindness of heart combined, doubtless, with the

idea of protecting one's trees from indiscriminate picking, the originators of the *pakewa* custom allocated a certain tree or trees to the use of the outsider. The tree was vested in the individual by name and could be used by him and his family. The use was enjoyed by his descendants, who traced their rights to the original agreement. The recognition of the equity of the custom has survived, but it has caused complications, owing to the increasing commercialism engendered by Western culture. Where self-grown trees have sprung up around the *pakewa* tree, these have been claimed by persons entitled to use the nuts. The need of the nuts for drinking while passing over the land may be rare, yet the mature nuts are gathered for the modern commercial purpose of making copra for sale to the traders. Some tree-owners accuse the landowners of having, in their turn, gathered the mature nuts for making copra. The situation is extreme when the owners of the *pakewa* trees deny that the trees were given by the *pakewa* custom and claim the land because their ownership of the trees is admitted.

An interesting modification of the custom occurs. Visitors are sometimes asked to plant a coconut so that the tree may serve as a memorial of their visit. An old lady persuaded me to plant a nut in front of her house at Rakahanga and referred to it as my tree. Should it grow and bear nuts, I should on a subsequent visit probably be given drinking nuts from it to quench my thirst while there, but my courtesy rights would end at that.

Property rights in land and coconut trees were definitely recognized. The loose attribution of commercial rights over property and land to Polynesian communities cannot be upheld. When within the subtribal areas, the land was distributed (*tuha*) among families. Each individual had a right to a share in the land, but the individuals were grouped in families of which the heads were the administrators. The members of each family lived together, worked together, and shared the produce of the land allocated to them. The things made by the individual were private property that he could dispose of as he deemed fit. Land and coconut trees, however, were family properties that descended by inheritance and were transmitted by inheritance. An individual had no right to dispose of land to outsiders without the consent of the family. He or the family had no right to dissipate the inheritance of posterity.

Although the boundaries between tribal lands became more or less fixed, the boundaries between family holdings were not fixed immutably for all time. The shares allocated to families within the larger family groups comprising subtribes were subject to change in each generation, in accordance with the ebb and flow of population. Just as the small family group interested in a family holding was constantly changing from generation to

generation, not only in personnel but in numbers, so the shares within the family area required redistribution from time to time. It was part of the duty of the *whakamaru* to see that these redistributions and readjustments were conducted with equity.

Owing to the recognition of bilateral descent, children could inherit a mother's share in her paternal estate, and families came eventually to have holdings of land in more than one district. How far this system of multiple holdings extended can only be fully decided when the Land Court investigates the land titles of the atolls. It is likely that the islands nearer to the villages were planted first, when the population was small. As the population increased, other islands were planted successively, and it is extremely probable that the descendants of the first planters have had a share in the planting of these islands. If so, it is extremely likely that the different tribes may have shares in a number of islands instead of having their shares consolidated in separate and adjacent islands, as they would had the families moved off and settled upon the lands they cultivated. This would further increase the number of holdings to which a family is entitled. The subject is one for further investigation.

In the Cook Islands the dominant *ariki*, when they established themselves, took care to reserve definite areas of land for themselves. Such lands went with the *ariki* title and were inherited by the successor to the title. I am not sure whether or not specific lands went with the *Whainga-aitu* and *Whakaheo* titles. It was definitely stated, however, that when the office of land distributor was conferred upon Huku-potiki, he was given the special grants of Paerangi in Rakahanga and Haroi in Manihiki to go with his office. It is probable, therefore, that special grants of land were made to the holders of the two *ariki* titles.

MATERIAL CULTURE

HOUSES AND FURNITURE

Introduction

The houses now in use in Manihiki and Rakahanga follow the architectural principle of the rectangular house used in the Cook Islands. These houses are characterized by long upright posts erected at the middle of each end to support directly the main ridgepole. It was held that this type was introduced, together with houses built of lime, by the Rarotongan missionaries, Aporo and Tairi. The original type of house, which was made in both atolls until comparatively recently, has been gradually displaced, but fortunately a single example survives in Rakahanga, characterized by the absence of end posts supporting the ridgepole and of wall posts supporting the wall plates.

Original House Type

FRAMEWORK

The framework of the original type of house is composed of paired opposite side posts supporting two longitudinal beams, which in turn support a number of crossbeams. The crossbeams support the wall plates on their ends. The principal rafters rest on the wall plates, and their crossed upper ends support the ridgepole without the assistance of king-posts. The architectural principle followed resembles that of the Samoan long house, except that the Samoans use king-posts to support the ridgepole and cross the principal rafters above the ridgepole instead of below it (28, p. 20). The ground foundation upon which the Rakahangan house is erected is termed *tango*.

The framework technique, described from the surviving original type house in Rakahanga, is as follows:

Skeletal framework (figs. 4-6). The longitudinal beams, crossbeams, and wall plates are lashed together on the ground before the supporting posts are erected (fig. 4). During the lashing each beam is supported by two short temporary posts slightly hollowed on the upper end to keep the round beams from rolling off. The temporary posts serve to raise the beams sufficiently high to allow the lashing patterns to be developed on the under surface. The two longitudinal beams and the crossbeams are of hala (*Pandanus*) trunks in the round. Nine crossbeams are used; of these, two are lashed close to the ends of the longitudinal beams and the remaining seven are evenly spaced to fill up the intervening space. Each crossbeam is securely lashed to each longitudinal beam with sennit braid. The somewhat thin wall plates are made of split hala wood. The two wall plates are laid over the ends of the crossbeams and lashed to each crossbeam with sennit braid. Three-ply braid (*kaha*) of a thicker size than that used on other parts of the framework is used for the beam and wall plate lashings (fig. 5). The turns of the braid are arranged to form decorative patterns on

the under surface of the longitudinal and cross beams. The pattern is formed by alternating curves; the common lozenge pattern of other areas is not used. The term for the curved turns is *ua,* and the phrase used for tightening up such turns is *uahia kia whakaketa.*

Four supporting posts (*pou*) (fig. 6) made of coconut trunks are spaced on the house site in the same manner as the temporary supporting posts, so as to coincide with the lashed frame of beams and wall plates, and arranged in two side pairs, the distance between the posts of one side being 19 feet and between opposite sides, 12.5 feet. The posts when fixed in the ground are 6 feet high. The upper ends are notched to take the longitudinal beams, which are thus kept in position without any subsequent lashing. In extra long houses, two posts instead of one are used at either end of the longitudinal beam, and the longitudinal beam (fig. 6) is formed of coconut trunk instead of hala wood. When the posts are in position the whole beam frame (fig. 4) is lifted and the longitudinal beams are fitted into the notches of the posts.

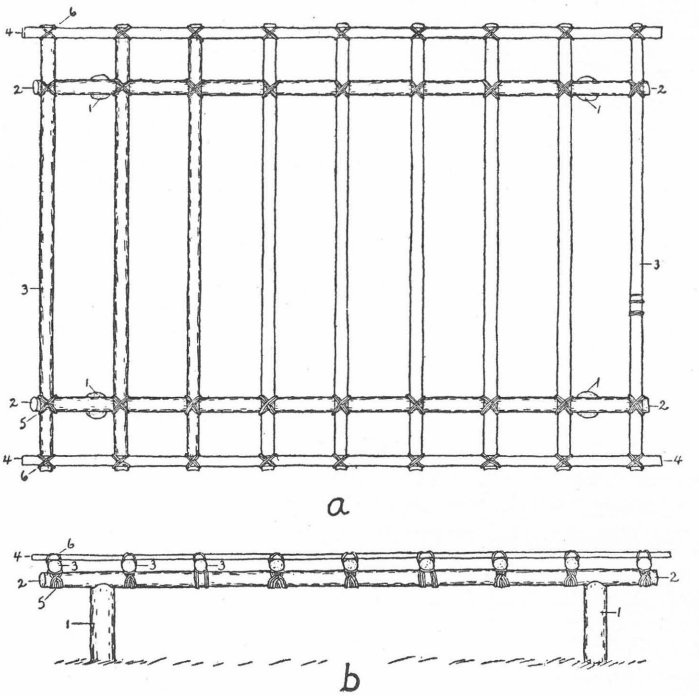


FIGURE 4. House framework: *a,* view from above; *b,* side view. 1, temporary posts; 2, longitudinal beams (*hapai*), 24 feet 3 inches long, 7 inches in diameter, laid parallel 12.5 feet apart; 3, crossbeams (*vae*), 17 feet 4 inches long, 5 inches in diameter, ends project 2 feet 5 inches on each side beyond longitudinal beams; 4, wall plates (*kaupapa*), 25 feet 2 inches long, 4 inches wide, and 1 inch thick; 5, lashing of crossbeams to longitudinal beams; 6, lashing of wall plate to crossbeams.

Roof framework (figs. 7, 8). A scaffolding (*turanga,* standing place) is erected to facilitate the erection of the roof framework. This scaffolding takes the form of a roof framework with two end uprights supporting a beam in the manner of a ridgepole. Poles resembling rafters are placed in a slanting position from the ground to the ridgepole on either side, and lashed. Horizontal poles are lashed like purlins to

the supporting rafters to form steps. The height of the end uprights and the slant of the side poles are adjusted so that the carpenters standing on the scaffolding can reach any part of the house roof from within. The method is widespread and has been described in detail for Samoa (28, p. 24).

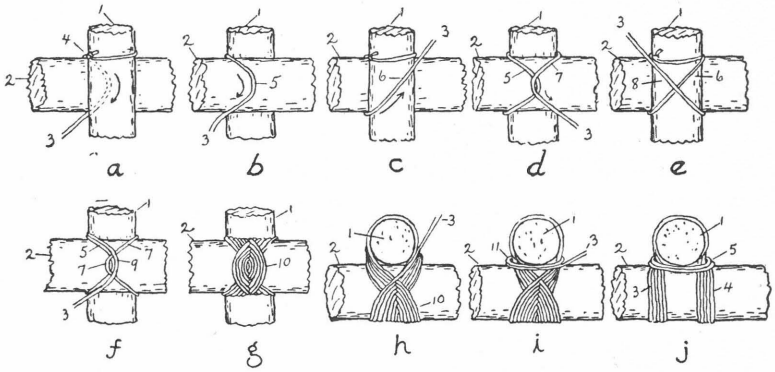


FIGURE 5. House framework, lashing of crossbeams (*vae*) to longitudinal beams (*hapai*) with curved pattern (*ua*). *a,* view from above: sennit braid (3) tied around *vae* (1) with running noose (4) and makes curved turn on under side of *hapai,* middle of curve crossing middle transverse line of *hapai* which corresponds to middle longitudinal line of *vae;* curved turn held in position by left hand. *b,* view from below, curved first turn (5) shown in position on under surface of *hapai* (2): braid (3) brought up on near side of *hapai* and on same side of *vae* (1) on which it commenced turn. *c,* view from above: braid (3) brought up over *vae* and makes diagonal turn (6) over *vae* to far right corner. *d,* view from below: braid (3) descends in far right corner and makes second curved turn (7) on under surface of *hapai,* crossing middle part of curve of first turn (5) and so fixing it in position; braid completes its turn by passing upward at near right corner. *e,* view from above: braid passes from near right corner diagonally over *vae* to far left corner making diagonal turn (8) which crosses over previous diagonal turn (6). *f,* view from below: diagonal turn over *vae* has brought braid back into far left corner from which it made first curved turn (5) in *b;* braid makes similar curved turn (9) but keeps closely to outer side of first turn (5) and in so doing crosses and fixes previous turn (7); from this position braid will cross back of *vae* and, appearing on under surface at far right corner, will make crossing curved turn to outer side of previous turn (7) from same side. *g,* view from below: repetition of first two curved turns successively applied on outer side of previous turns from same side results in pattern (10), which is continued until lashing sufficiently firm and pattern developed to taste of craftsman; lashings averaged 8 from one side and 7 from other, making 15 in all. *h,* side view showing crossings of turns on one side and half of main design (10), braid (3) in position to make horizontal fixation turns to fix lashing. *i,* side view: braid makes horizontal circumferential turn (11) around lashing turns where they pass between two wooden elements of frame and so tightens lashing; few turns made; braid passed through one or two loops to form half-hitches which fix end of braid. *j,* side view: alternate lashing formed by running turns from either side straight around *hapai* instead of using curved turns, crossing above *vae* being exactly similar to those in previous lashing; two parallel bands (3, 4) on under surface of *hapai* thus formed; circumferential horizontal turns (5) made as in *i*; diagonal crossing turns above *vae* not arranged in any definite lozenge pattern in either lashing, as they cannot be seen from below.

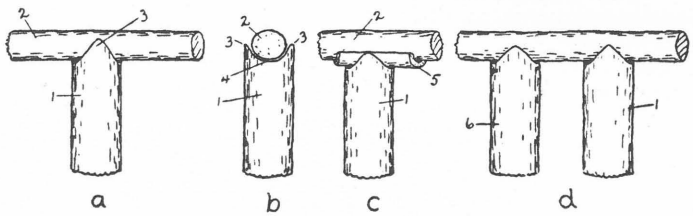


FIGURE 6. House framework: upper ends of supporting post (*pou*) notched to receive longitudinal beams (*hapai*). *a,* side view; *b,* end view; *c,* side view with chock to steady beam; *d,* side view of long house, each post reinforced by another placed close to it. 1, notched post, 6 feet above ground, 11.6 inches in diameter; 2, longitudinal beam; 3, triangular projection of notch; 4, curve of notch, fits beam; 5, chock, segment of hala trunk inserted to steady beam when notch and beam do not fit; 6, extra post used for long houses.

The principal rafters (*oka*) are natural hala poles in the round. The two end pairs of rafters and six intermediate pairs are evenly spaced. The top ends of each pair are cut to fit against each other, and lashed. An end pair of rafters is 17 feet 6 inches long and 5.3 inches in diameter at the lower thicker ends. Toward the lower ends, the rafters are notched to fit against the wall plate (*kaupapa*) and lashed, having a projection below the wall plate of 4 feet 3 inches. (See fig. 7.) The pairs of end rafters are lashed in position, and a sennit line is stretched between their apices. The intermediate pairs are spaced, and after their upper ends are lashed they are raised to touch the stretched line. The parts touching the wall plate are then marked and notched on the inner side to fit against the wall plate, to which they are lashed. The intermediate pairs are not cut to exactly the same length as the end pairs, but their extra length simply projects beyond the wall plate. They are, however, graduated, for the pairs next the end pairs are 4 inches longer, the next two pairs from either end are 5 inches longer, and the two middle pairs are 8 inches longer. These projections thus give the line of the lower ends a slight convex curve from end to end. The main ridgepole (*tauhuhu*) is laid in the forks formed by the crossed upper ends of the principal rafters, and lashed to them. It is made of split hala wood 3 inches wide by 1 inch thick. The purlins (*tarawa*) consist of five on either side. The material and dimensions are the same as the main ridgepole. The purlins are laid horizontally over the principal

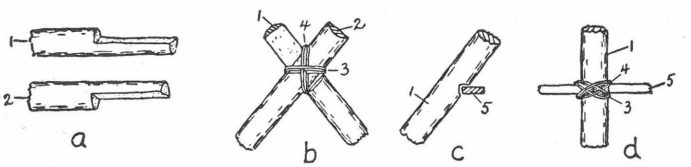


FIGURE 7. Roof framework: principal rafters (*oka*), shaping of upper ends and lashings. *a,* top ends of pair of rafters (1, 2) with about half of section cut away to form flat surfaces to fit against each other. *b,* pair with flat surfaces of top ends laid against each other when crossed; braid lashing fixed to one rafter with running noose; alternate horizontal (3) and vertical (4) turns made around opposite angles to lash pair together. *c,* side view, lower part of rafter (1) where notched to fit against wall plate (5.) *d,* outer side of rafter (1) resting against wall plate (5), lashing of diagonal turns (3, 4) cross on outer surface of rafter and pass transversely around wall plate; after first crossing turns, subsequent turns made to outer side above and below; first turns to form lozenge pattern shown.

rafters, spaced so that three are above the level of the wall plate and two below it, and lashed to each principal rafter with sennit braid. The *ua* lashing consists of two curved turns from either side, or four altogether. The purlins are composed of two pieces overlapped and lashed together with transverse turns. Diagonal struts (*toko*) made of split hala 4 inches wide and 1 inch thick are used to steady the rafters on each side of the roof. On one side the strut is lashed above to the main ridgepole on the inner side of the second pair of rafters from one end. Thence the strut extends diagonally downward to meet the wall plate, to which it is lashed between the second and third rafters from the other end. It thus crosses four intermediate rafters, to each of which it is lashed. The strut on the opposite side of the roof is also lashed above to the ridgepole on the inner side of the second rafter from one end, and its lower end is lashed to the fourth rafter from the other end just above the wall plate, which it does not meet. This strut thus crosses and is lashed to three rafters. The lashings to ridgepole and rafters are by means of oblique turns passed around both elements in one direction only, and finished off with circumferential turns passing around the previous lashing turns and between the two wooden elements. There are 18 rafters (*whakakaho* or *tokotoko*), made of split hala wood 1 inch wide by 1 inch thick, on either side. One rafter is outside of the end walls on either side at either end. The rafters are then spaced about 1 foot 7 inches apart. The upper ends are crossed above the main ridgepole and lashed together at the crossing. The braid, after each lashing, is brought down and takes a complete turn around the main ridgepole. From there it passes down to the uppermost purlin and is used to lash the thatch rafter to the purlin with three or four curved turns in the *ua* pattern. By this means the thatch rafters are securely anchored down to the framework. The thatch rafters are all lashed to each purlin with the same *ua* lashing in three or four curved turns. For the thatch-rafter lashing, two-ply twisted sennit cord (*whauhoto*) is used instead of three-ply braid. The upper ridgepole (*tauhuhu iti* or *takiri kaho*), a long slender rod of split hala, is laid in the forks formed by the crossed thatch rafters, and lashed to them. The braid, after each lashing, is brought around the main ridgepole to anchor the upper ridgepole securely in position. The upper ridgepole is also called *tokotoko,* as it is of the same size as the thatch rafters. The eaves rod (*turuturu iti*), of the same material and size as the thatch rafters, is lashed to the lower ends of the thatch rafters on

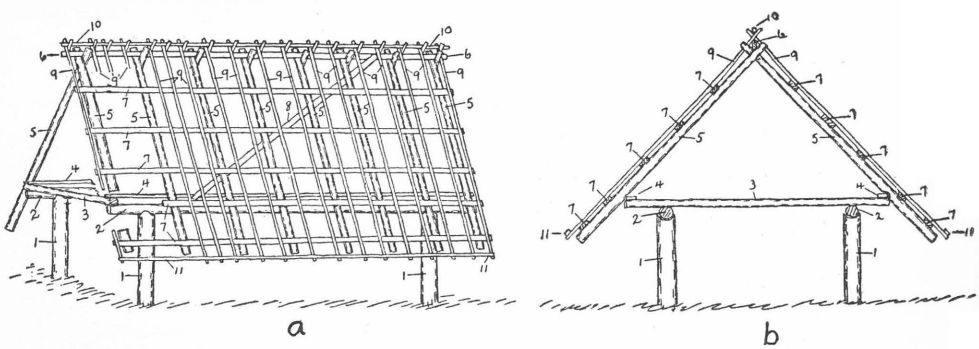


FIGURE 8. Roof framework of house: *a,* side view, left end near principal rafter, four thatch rafters and end of fourth purlin cut away to show underlying parts of frame; *b,* end view. 1, supporting posts (*pou*); 2, longitudinal beams (*hapai*); 3, cross-beams (*vae*); 4, wall plate (*kaupapa*); 5, principal rafters (*oka*); 6, main ridgepole (*tauhuhu*); 7, purlins (*tarawa*); 8, diagonal strut (*toko*) attached to main ridgepole above and to wall plate below, crossing four rafters to which it is also attached; 9, thatch rafters (*whakakaho*); 10, upper ridgepole (*tauhuhu iti* or *takiri kaho*); 11, eaves rod (*turuturu iti*).

their outer side. The attaching of the eaves rods completes the roof framework (*tua*). The wooden elements composing the *tua* are shown in figure 8.

End framework (fig. 9). The framework which closes in the ends (*tara*) of the house is composed of horizontal purlins and vertical rods which supply the thatch rafters, to which the thatching is attached. Wooden chocks (*pono*) are used to push out the lower end of the framework. Four horizontal purlins are stretched across the space between the end pair of rafters with the ends resting on the ends of the side purlins, to which they are lashed. The lowest purlin in the actual house is level with the end crossbeam, but in figure 9, *a*, it is a little too high. A mesial, rather thick rod is attached above to the crossing of the end rafters and lashed to the outer side of the four purlins. Its lower end projects a short distance below the lowest purlin. Two other vertical thin rods of thatch rafter material and size are spaced on the left and four others on the right. These lie outside of the four purlins and are lashed to them at the crossings. Above, they meet the end rafters, to which they are lashed. Below, they project slightly beyond the upper level of the lowest side purlins. Two additional purlins are next attached to the vertical rods on either side of the mesial rod, and their outer ends to the end rafters. The lowest purlins are on the upper level of the lowest side purlins. The cutting short of the mesial vertical rod leaves a space for the end entrance. The purlins are pliable, and chocks (*pono*) are placed between the end crossbeam and the fourth purlin to push the framework out a little from the perpendicular (fig. 9, *b*). The chocks, pieces of hala wood 4 inches by 2 inches, are three in number. The longest chock (fig. 9, *b*, 13) is 11 inches long and is placed immediately behind the mesial rod. Two others, 9 inches long, are placed also between the end crossbeam and fourth end purlin but directly behind the vertical rods on either side of the mesial rod. The fourth purlin gives a little extra length, and any adjustment of the lashing at the ends can be dealt with after the chocks are placed in position. Thus the lower end of the framework is not only pushed out slightly from the vertical, but by means of the graduated chocks the fourth end purlin has a slight outward, convex curve.

Dimensions of completed framework: total length in middle line, 26 feet 2 inches; width between eaves rods, 23 feet 11 inches; height from floor to main ridgepole, 16 feet 5 inches; height from crossbeams to main ridgepole, 10 feet; height of eaves rods from ground, 3 feet.

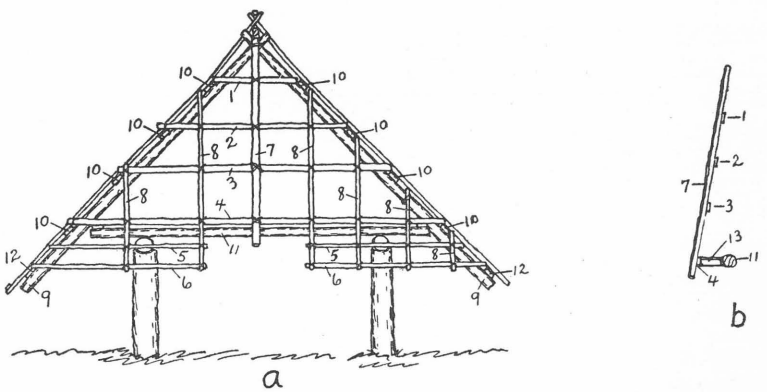


FIGURE 9. End framework of house: *a*, end view from outside; *b*, section showing mesial rod pushed out from side with inserted chock. 1-4, horizontal purlins; 5, 6, additional purlins; 7, mesial rod; 8, vertical rods; 9, end pair of rafters; 10, side purlins; 11, end crossbeam; 12, lowest side purlins; 13, chock (*pono*); two vertical rods, one on either side of mesial rod, pushed out from side with shorter chocks.

THATCH

The roof and ends were thatched with sheets of lauhala (*rau whara*; *Pandanus* leaves) in which the leaves were bent over strips of aërial hala rootlets. The rootlets (*kawhara,* not *kai whara,* or rootlets with lower ends still in the air) which had reached the ground were used. The prepared strips (*kaho,* pronounced "kaheo") measured 4 finger spans (*anga honu,* finger span), or about 3 feet.

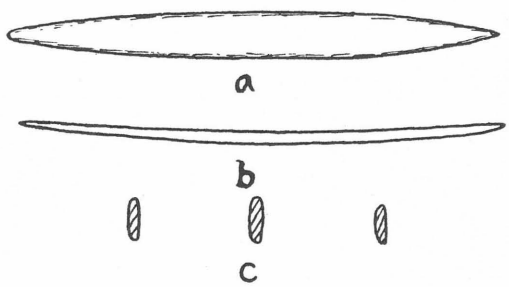


FIGURE 10. Roof sheet needle (*tuiau*): *a,* upper view, needle pointed at both ends, left end of type needle (B. P. Bishop Museum, C. 2811) slightly blunter than other; *b,* side view, upper surface slightly concave longitudinally; *c,* cross-sections with upper surface to right, upper surface slightly flatter than other, side edges rounded off. Total length, 10 inches; middle width, 0.9 inch; middle thickness, 0.4 inch; section about halfway between middle and points, 0.8 inch wide and 0.3 inch thick.

A roof sheet needle (*tuiau*) made of *ngangie* wood was used to sew the leaves together over the *kaho* strip. (See fig. 10; pl. 1.) The needle was exactly similar in shape to that of Tongareva. The butt ends of the lauhala were doubled over the *kaho* strip in the same way as in Tongareva and the Cook Islands (27, p. 15). When the leaves were pierced transversely with the needle, dry coconut leaf midribs (*tunikau*) or thin strips of aërial hala rootlets were passed through the holes made and kept the leaves together. The sheet was made the full width of the *kaho* strip (3 feet) and when completed was also termed a *kaho.* The full supply of sheets was made and the thatching (*ato*) commenced. The technique is as follows:

Thatching (*ato*) commences from below and works upward. The first sheet of lauhala is laid across the thatch rafters just above the eaves rod at one end of the *tua* frame. The part doubled over the hala rod is toward the top, and the doubled-over butt ends of the leaves are outside. The end of a piece of sennit braid is tied to the thatch rafter with a running noose. The braid is carried over the edge of the sheet to the right of the rafter. A hole is punctured through the sheet below the contained rod and to the left of the rafter. The braid is passed back through the hole from the outside and makes either a half-hitch or an overhand knot with its standing part and so fixes the stiff upper edge of the sheet to the thatch rafter. Subsequent sheets are added a little higher up the rafter than the one preceding, and a similar fastening is made with the continuous braid. The method is exactly similar to that used in the

Cook Islands (*27*, pp. 20-23). For piercing the holes through the sheets, the fingers are generally used, but it was said that a hooked thatching needle was sometimes used. (See pl. 1.) No local name could be remembered for the implement, and as the people boasted that their method of piercing holes with the fingers was much quicker than the Rarotongan method with the needle, it is probable that the thatching needle was introduced from that area but never became popular. A Rakahangan thatching needle made of *ngangie* wood is shown in figure 11. It resembles the roof thatch needle in its width, which exceeds that of similar implements from the Cook Islands (*27*, p. 19).

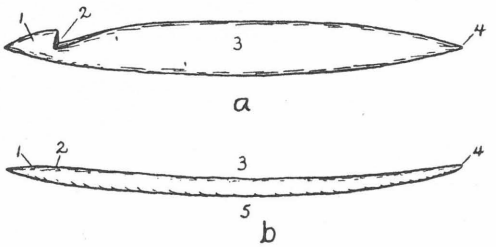


FIGURE 11. Thatching needle: *a*, upper surface view; *b*, side view. 1, notch point, used for puncturing thatch sheet; 2, notch, hooks up braid and draws it back through sheet; 3, upper surface, concave longitudinally and fairly flat transversely; 4, unnotched point, may be used in sewing sheet together; 5, lower surface, convex transversely, side edges rounded off. Length, 11 inches; mesial width, 1.2 inches; mesial thickness, 0.4 inch; notch point, 1.2 inches long; base of notch point, 0.7 inch wide and 0.4 inch thick; other point at same distance (1.2 inches) from end, only 0.2 inch thick; notch, 0.3 inch deep.

The thatcher works a width of one sheet until he reaches the ridgepole, when another strip of thatching is commenced with the adjacent edges of the new sheets slightly overlapping those already fixed. The completed upward width of one sheet is known as a *marewa*, and the length of the house is referred to in the number of *marewa* it takes to thatch one side of the roof. The thatcher works from the inside of the house, and as he works upward he ascends on the scaffolding within, which is allowed to remain until the thatching is completed. An assistant carries the roof sheets and places them in position from the outside. The thatcher within usually spaces the upper edge of the sheet from the one below by the number of fingerbreadths decided upon. The closer the sheets are together, the better the house, but close thatching takes more material in sheets and sennit and involves a corresponding increase in labor.

The assistant uses a lifting pole (*tukutuku*) made of *whano* wood (fig. 12) to place the sheets in position when the thatching rises beyond his reach. The point of the long pole is stuck into the outer surface of the sheet in the middle line just below the site of the transverse hala rod at the upper edge. The shoulder prevents the pole from going in too far. The assistant lifts up the sheet with the point and swings it into position above the last sheet tied. The thatcher within adjusts it accurately and then lashes it.

FIGURE 12. Point of lifting pole (*tukutuku*) for thatch: *a*, front view; *b*, side view. Thinner end of convenient-sized pole, about 14 feet long, is cut at one end for about 2 inches into point with sharp curve proximally to form distinct shoulder (1).

The roof ridging is attended to after both sides of the roof have been thatched. The lauhala sheets have been extended as high as the ridgepole. The first stage in the roof ridging consists of applying a double sheet of lauhala on either side with the upper edges meeting in an apex above the upper ridgepole. The two sheets of either side are then sewed together with two-ply twisted sennit cord. The two double sheets thus sewed together (*uihau*) extend from end to end of the ridge. The second stage consists of reversing two plaited coconut leaf mats (*pora*) (see p. 111) with the shiny upper surface of the leaflets on the outside. These are doubled over the *uihau* and kept in position by passing pointed wooden pins about 2 feet long through the mats from side to side, taking care that the pins pass through between the upper and main ridgepoles. The upper ridgepole prevents the pins from working upward and thus anchors the mats in position. The reason for reversing the two *pora* mats is that there may be one unsplit midrib edge on either side of the ridgepole to hold against the pins. The double mats are laid on with a slight overlap until the ridgepole is covered from end to end.

The ends of the house are also thatched with lauhala sheets, the sheets being tied to the vertical elements of the framework in the same way as in the roof thatching. Some adjustment is required in cutting some of the sheets to fit in with the changing width of the area covered. The ends of the lowest sheets on both the sides and the ends are cut off a little below the eaves rod in a straight line to form the eaves (*turu-turu*). At the ends the eaves are 3 feet 2 inches above the ground, and on the sides, 3 feet.

INTERIOR

A high platform (*whata*) was constructed in the old houses by laying longitudinal joists (*tarawa*), five on one side and four on the other to leave a space for an opening, over the crossbeams (*vae*), and then laying cross pieces or poles closely over the joists to form a floor (*papa*). (See fig. 13.)

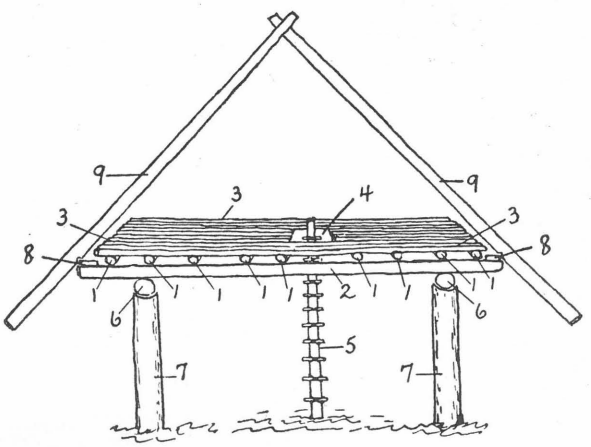


FIGURE 13. House platform (*whata*), or upper story: 1, longitudinal joists (*tarewa*); 2, crossbeams (*vae*); 3, cross pieces forming floor (*papa*); 4, opening (*ngutu whata*, door of platform); 5, ladder (*ara*); 6, longitudinal beams (*hapai*); 7, posts; 8, wall plates; 9, principal rafters.

Through the left side of the rectangular opening (*ngutu whata*, door of the platform) made in the middle of the floor by the use of shorter cross pieces on either side, the upper chamber formed by the platform was reached by means of a ladder (*ara*) placed in a slanting position. The ladder was formed of a stout piece of hala trunk with short cross pieces lashed on as steps. The upper story was also used as a dormitory and as a storage space, especially for the mature coconuts kept to form the *takataka* stage. In special houses set apart for the tribal gods, the bodies of dead chiefs were laid out on the high platform.

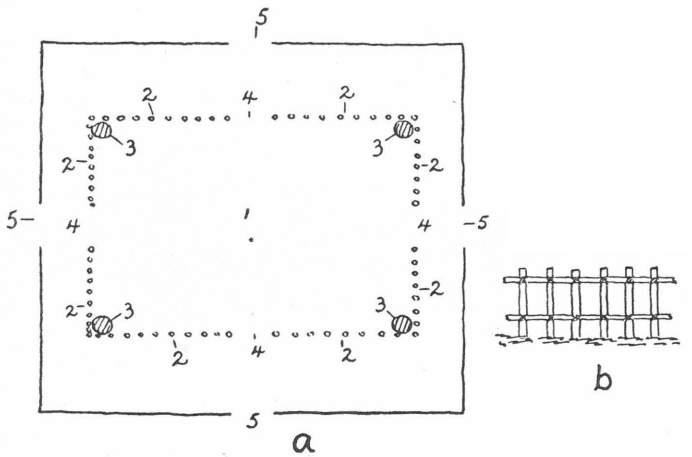


FIGURE 14. Interior arrangement of house: *a*, ground plan; *b*, detail of fence (*apaapa*). 1, inner sleeping division; 2, fence formed of uprights 2 feet to 2 feet 3 inches high, some of which are driven into ground to act as posts, and two horizontal rods lashed to uprights; 3, supporting posts; 4, openings in fence; 5, doorways of house.

The house platform (*paepae*) now seen in dwelling houses of the Rarotongan type, is an innovation which accompanied the houses introduced by the missionary, Aporo, from Rarotonga. The old type of house was built on the flat ground without any raised platform. Curbstones, such as mark some of the Tongarevan houses, were not used.

The ground floor was usually divided by a low fence (*apaapa*) into an inner rectangular sleeping part and an outer part contiguous to the sides and used as a dining room. The site of the fence was guided by the position of the supporting posts of the roof. The fence had middle gaps opposite the house doorways in all four sides to give admittance to the inner sleeping part. (See fig. 14.)

WALL AND DOOR SCREENS

Wall screens (*pataro whani*) of plaited coconut leaves were used to form side or end walls when required, there being no permanent walls as in the Rarotongan type of house. The eaves of the house were fairly low, so that the depth of one screen was enough to reach the ground. Above, the screens were tied to a convenient part of the framework and simply hung down. The wall so formed was termed *haihai.* For the technique of the screen, see page 111, and for their appearance when hung, see plate 1.

Doorways (*ngutupa.*) The structure of the end framework to provide for end entrances has been shown in figure 9. The middles of the sides were also used as entrances, but here one had to stoop below the eaves to enter. The doorways were closed with *pataro whani* mats identical in structure with the wall screens.

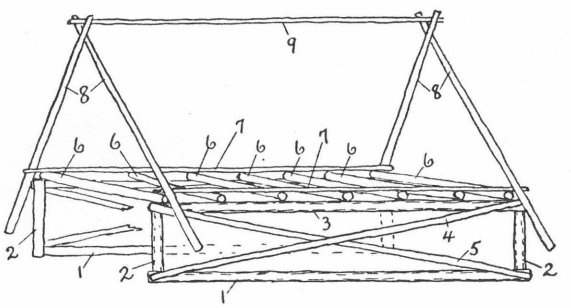


FIGURE 15. Portable house (*whare taka*): 1, lower horizontal beam (*hapai*); 2, upright supporting post; 3, upper longitudinal beam (*hapai*); 4, 5, diagonal braces; 6, cross pieces; 7, longitudinal wall plates; 8, end pairs of principal rafters; 9, main ridgepole. (Native terminology as in figure 8.)

WHARE TAKA

A small portable house (*whare taka*) was constructed without supporting posts fixed in the ground. (See fig. 15.) Short supporting posts were lashed to either end of longitudinal beams (*hapai*) laid on the ground. Other longitudinal beams, also termed *hapai,* were lashed to the tops of the short posts. Two diagonal crossed braces used on each side to brace the two longitudinal beams and posts together were lashed at the corners and at the point of crossing. The two sides so formed were held upright, and cross pieces were laid across the upper longitudinal beams and lashed. The longitudinal wall plates were laid over the ends of the cross beams. The addition of principal rafters, purlins, thatch rafters, upper ridgepole, and eaves rod follows the method described on page 74.

Whare Tuku Whakararo

A low house without supporting posts (*whare tuku whakararo,* house let down) was, as the name implies, let down to the ground by doing away with the supporting posts (*pou*), longitudinal beams (*hapai*), crossbeams (*vae*), and wall plate (*kaupapa*). Thus the principal rafters rested directly on the ground and formed a roof without walls. The house (fig. 16) was built for use in the hurricane season. As it had no side walls, the wind could not get under the roof to blow it away. The framework technique follows that already described.

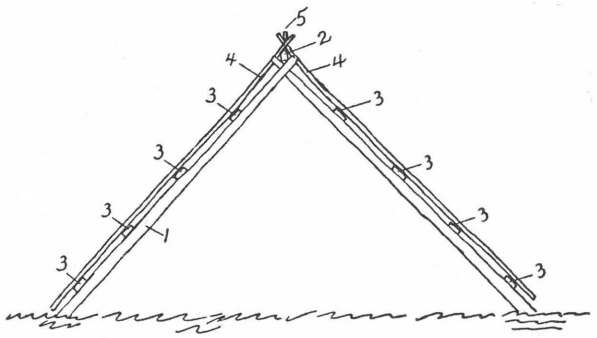


Figure 16. House without supporting posts (*whare tuku whakararo*), end view of framework: 1, principal rafters; 2, principal ridgepole; 3, purlins; 4, thatch rafters; 5, upper ridgepole.

Rarotongan Types of Houses

Two variations of the Rrarotongan type of house introduced by the missionaries are shown in plate 1. The ridgepole is supported directly by end posts. Wall posts along the sides support a wall plate, also directly. The principal rafters extend between the ridgepole and wall plate, but their upper ends are crossed above the main ridgepole instead of below it. The upper ridgepole then rests in the forks formed by the principal rafters. The details of the Rarotongan form of framework have been described (27, p. 4).

One of the houses, used as an assembly place, has straight thatching at the ends and to almost the level of the side eaves. Below the thatching of the sides and ends the house is open. The other house is used for sleeping, and as a result of missionary influence, no doubt, the sides and ends are walled in. The walls receive the Rarotongan name, *paruru,* as they differ from the local *haihai* of movable screen sheets. The walls have also departed from the Rarotongan pattern in that the rods used to fill in the spaces between the wall posts are attached horizontally instead of vertically. The end thatching is also projected outward at its lower end to form a veranda. A raised platform of lime surrounds the house.

A third variation (fig. 17), which is popular in small dwelling houses, consists of carrying the outward projection of the *tara* (pl. 1, *B*, 1) to both ends and on the two sides. The small house is thus surrounded by a wide veranda on all four sides, and when set on a raised platform, the covered area looks more extensive than the space actually contained within the walls. The principle, however, of providing plenty of veranda space is a sound one for the tropics.

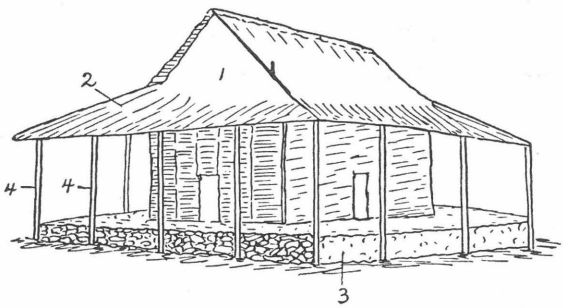


FIGURE 17. Rarotongan type of house, with surrounding veranda: 1, end, with lower part projected to form veranda roof; 2, veranda roof; 3, house platform; 4, posts supporting outer edges of veranda roof.

HOUSE FURNITURE

Seats (*nohoanga*). Though the people usually sat on mats on the ground, a wooden seat (fig. 18) was made of *tou* timber. The seat was rectangular with the slightest curve from side to side and was supported by four legs all cut out of the solid timber with the seat. It was maintained that these were made in Rakahanga in olden times.

The seats are much less curved than those of the Cook Islands (27, p. 43), and the lower ends of the legs are plain and without the heart-shaped feet characteristic of the islands to the south.

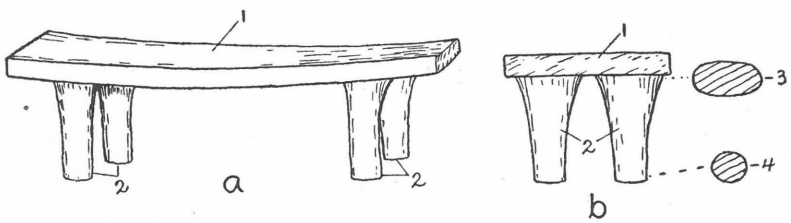


FIGURE 18. Wooden seat (*nohoanga*): *a*, side view; *b*, end view. 1, rectangular seat, 24.25 inches long, 9.25 inches wide, and 1 inch thick, upper surface 7 inches from ground at either end and 6.5 inches at middle; 2, legs; 3, elliptical cross section of leg at junction with seat, 3.4 inches in transverse axis of seat and 1.9 inches in longitudinal axis of seat; 4, round cross-section of leg base, diameter 1.5 inches.

A round wooden box (*puiha*) 10 inches in diameter at the bottom, 8 inches at the top, and 9 inches high, was seen. It had ten short legs 0.25 inch high and 0.5 inch by 0.4 inch in cross section. The upper edge had an inner raised rim which fitted against an outer raised rim on the edge of a wooden lid, which was provided with a perforated knob in the center of its upper surface. A perforated lug at the opposite ends of a diameter had been cut out of the solid on the outer surface of the box. A cord passed through the lugs and the lid knob to fasten the lid in position. As *turuma* was an alternative name given to the box, I pointed out that the term *tuluma* and the details of the box construction existed in the Tokelau Islands. At first it was stoutly maintained that the box was native to Rakahanga, but later an old man conversant with its history was found who stated that it was brought from Tokelau by Tuteru-utua, who acquired it during his wanderings after being deposed from the position of *Whakaheo*. The wooden box, therefore, does not belong to the local culture, but the box and the incident are described here to clarify the position and prevent its being accepted when no further historical check may be available.

Brooms (*ruruku tu nikau*) were made of coconut leaflet midribs (*tu nikau*) which were bound together (*ruruku*). The midribs, as they were detached, were torn off with a jerk which brought away a thin strip of the main leaf midrib. Then the thin ends were plaited together in a three-ply braid until a sufficient quantity was thus provided. The braided end was then rolled to form the midribs into a bundle, which was bound below the braided ends. With such brooms the houses were swept clean. The same form of broom is common in the Cook Islands and other islands, and exists in Samoa.

FOOD

Introduction

In comparison with high islands, the low volcanic islands or atolls are greatly restricted as to natural variety in food. Manihiki and Rakahanga were not on the ancient sea routes followed by the voyaging canoes that sailed between Society Islands and Cook Islands, and this may in part account for the failure of many of the foods carried by the early Polynesians to reach these two atolls. The pig, the dog, and the domestic fowl were not known. A small rat, no doubt introduced accidentally, was not eaten, according to the inhabitants. For flesh foods, the people depended on the sea and the lagoon. Certain sea birds with their eggs also augmented the larder. Of vegetable foods, the introduction of the coconut was attributed to Huku, who, besides planting a *ni ponga* which floated ashore, brought others from his land of birth. Tradition does not connect Huku with the *puraka* (species of taro)

which was grown on the atolls. It is probable that this plant was brought in by some of the local voyagers who were reputed to have visited other lands, such as Tokelau, and to have returned. If Huku did come from Rarotonga, his not bringing the *puraka* is in accordance with the fact that the *puraka* was not grown on that island. If he brought other species of taro they perished, for the *puraka* seems to be the only species that thrives in Manihiki and Rakahanga. The presence of the *puraka* resulted in the use of wooden pounders which are not found on Tongareva, owing to the absence of that food plant, and of coral slabs for grating. Of the native plants, the hala (*Pandanus*) and the *Morinda citrifolia* were the only ones that could be utilized. If the hala was introduced, there is no historical narrative supporting its diffusion as there is in Tongareva. With the main vegetable supplies consisting of the coconut and the *puraka,* the people made the best of their limited resources by serving them in as many different forms as possible to add variety to their diet.

Variety of cooking utensils was also restricted by paucity of material. Much of the food was prepared in the kitchen, a separate establishment set at the back of the dwelling house to shelter the earth oven from the rain.

Fire

Fire was generated (*hika*) by means of a typical Polynesian fire plough. A groove was rubbed on a lower piece of dry wood (*kauneti*) by means of a pointed rubbing stick (*kaurima*) of hard wood. It was customary for an assistant to steady the far end of the *kauneti* by pressing it firmly on the ground with the foot. This process of pressing down (*tomi;* Maori, *taomi*) the under piece was regarded as necessary, as shown by quotations from fire myths. By the friction of the *kaurima,* particles of wood collected at the far end of the groove, smouldered, and ignited (*kua tu te ahi*). The ignited particles were blown upon gently to light up the wood dust and were then emptied onto a piece of dry coconut husk (*puru*), which, by gentle waving to and fro, was also ignited. From the flaming *puru* the fire was lit.

Firewood was a problem, as native forests were not extensive. Dry branches of trees were used, but the coconut, besides supplying food, also provided much of the firewood used. The dry flower sheath (*taume*) and the dry flower stalks (*roro*) were gathered for heating the oven. Empty coconut shells (*ipu*), thrown in heaps near the kitchen, were utilized for firewood as they are even to the present day.

The earth oven (*umu*) was used, but suitable stones which exist in abundance in high islands were absent on the coral atolls. Recourse was had, as in Tongareva, to coral and *Tridacna* shells. The coral, after one heating, became friable, and fresh material had to be collected for each oven. The

lack of suitable large leaves in the local flora led to the plaiting of special sheets from coconut leaves to provide covers for the food while it was cooking, in order to retain the heat. Thus the people of the atolls of Rakahanga and Tongareva used plaited oven covers like their kinsmen in New Zealand, whereas those of Cook Islands and Society Islands used covers of breadfruit, banana, and other large leaves which their flora provided in abundance.

Tongs (*pingohi*) made by doubling pieces of coconut leaf midrib were used to lift heated stones from the oven in some of the culinary operations and in the making of coconut oil.

Fire Myth

The widespread fire myth associated with the culture hero, Maui, is present in Rakahanga, but it differs somewhat from versions of other areas in that the fire was obtained from Tangaroa-tuhi-mata. According to a manuscript written by Tupou-rahi, Tangaroa-tuhi-mata was the paternal grandfather of Maui and dwelt in the underworld, Hawaiki-i-raro. The underground residence coincides with that of Mahuika in Maori myth and of Mafui'e in Samoan myth. The Rakahangan version has evidently mixed up the names of a widespread legend. Makuai-whare, unable to light her fire, sent her son Maui to his grandfather in the underworld to obtain a lighted piece of firewood (*motumotu*), instructing him not to go by the forbidden path (*ara tapu*) but by the common road (*ara noa*). Maui, true to the mischievous perversity with which he has been credited by all branches of the Polynesians, went by the forbidden path. Tangaroa, seeing a man approach by the path restricted to the gods, commenced to work magic. He raised his right hand, but Maui likewise raised his hand and continued to walk toward Tangaroa. Tangaroa raised his left hand and then both hands, but Maui raised both hands and kept moving. Tangaroa turned one side (*koko*), but Maui also turned, and approached sideways. Tangaroa turned his other side and Maui followed suit without slowing his progress. Tangaroa turned his back; Maui copied him and walked backwards toward Tangaroa. The various magical movements having failed to impede Maui's progress, Tangaroa desisted and asked Maui who he was and what he wanted. Maui informed his grandfather of their relationship and asked for a light to kindle his mother's fire. Tangaroa proceeded to generate fire while Maui held down (*tomi*) the lower fire stick. A piece of lighted husk was then given to Maui, who, when he was out of Tangaroa's sight, extinguished (*pokia*) the brand. Maui returned with the excuse that he had fallen down and accidentally put out the fire. Tangaroa told him to take the *kauneti* and generate the fire himself. Maui proceeded to do so, but as

Tangaroa did not press down the fire stick, it moved about (*hinga-hinga*). Maui complained, and Tangaroa said, "Call those birds to fly hither to steady it." (*Uru atu ki na maimua, kia rere mai kia tomia.*) Maui perceived two large sea birds (*kakave*), which, when Maui called, flew down and steadied the fire plough by standing on the far end. Maui, having successfully generated the fire, rewarded his assistants by striking them on the head with the hand stick (*kaurima*). One flew north and the other south, and to this day the *kakave* birds bear on their heads the marks (*whakairo*) of Maui's fire stick. After an interlude, Maui returned to his mother with the lighted husk.

A further mythical incident in the Maui exploits associates fire with the great exploit of snaring the sun. The Maoris, who were agriculturists, say that the reason for the snaring was to retard the speed of the too rapidly moving sun in order that man might have more time to cultivate food. The Rakahangan myth states that there was barely time in the course of the sun's journey across the sky to light one fire. Maui journeyed to the opening (*rua*) from which the sun emerged and twice snared him with ropes of sennit braid (*kaha*), but each time the sun broke away. The sun is referred to as "te tama nui a Hina ko te ra" (the great son of Hina was the sun). Hina was the caretaker of the opening through which the sun emerged. After his failures, Maui sought counsel with her. Her advice (*wananga*) was to make a snare (*here*) with strands of her hair (*iho rauru*). With the hair snare, Maui captured the sun and made the following terms before he let him go. The sun was to proceed slowly (*haere maria*) to enable mankind to light a morning fire (*ahi popongi*), a day fire (*ahi awatea*), and an evening fire (*ahi ahiahi*). The sun consented and has ever since carried out his bargain.

Cooking Utensils and Food Accessories

Nature provided in the hard shell of the coconut a natural cooking receptacle. The stalk end of the nut was tapped all around with a stone and removed. After the flesh within had been grated with a hand grater, the fluid was poured back and the top of the shell was replaced as a cover. The shell was then placed in the *umu* with the other food, and the coconut preparation was cooked in its own natural container, which served as pot or casserole. Fish were sometimes cooked in coconut containers.

A coconut shell cup (*ipu*) used as a drinking cup for water was made by cutting off the base end of the mature husked shell. Coconut fluid was drunk directly from the opened green nut.

A water vessel (*ohonu*) was provided by the larger mature nut, the eye hole being punctured and the flesh rotted out with sea water.

Wooden bowls (*kumete*) were made of trunk sections of *whano* and *tou* timber. (See fig. 19.) They are now fairly scarce, for trade dishes are easily procured. The bowls seen were elliptical, with projecting lugs for handles, flat bottoms, and no legs. They somewhat resemble the type in common use in Samoa. Other types are figured by Edge-Partington (6, series 1, p. 62, nos. 2-4). Bowl number 2 (fig. 19, *c*) Edge-Partington describes: "Oval bowl carved out of cinnamon-colored wood, the carved design is similar to that on the High Island and Mangaian adzes." The bowl

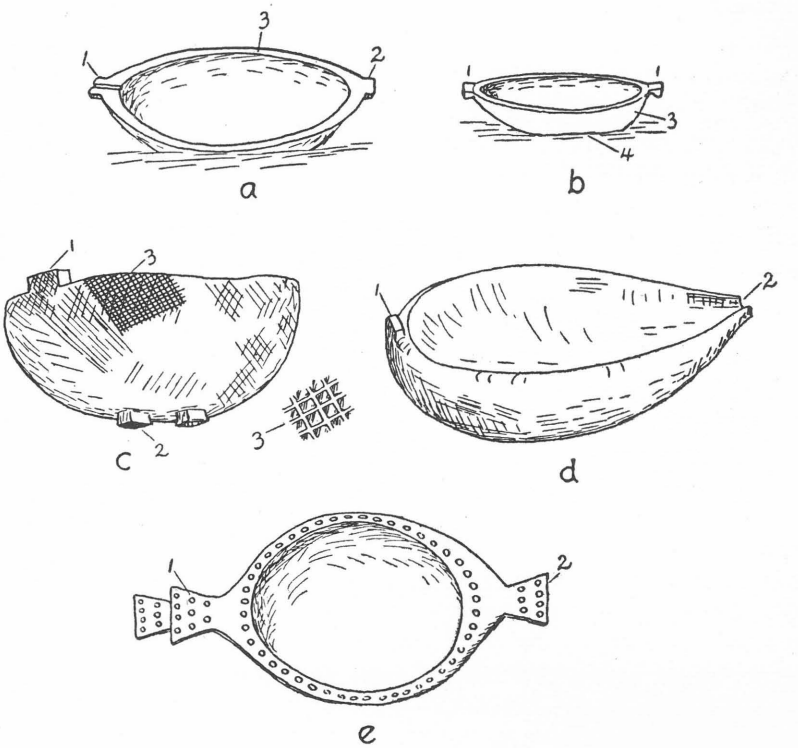


FIGURE 19. Wooden bowls (*kumete*). *a,* large elliptical bowl with handles (1, 2) and flat rim (3) which widens out at ends, surface on same plane as upper surface of handles; left handle (1) grooved on upper surface to serve as spout for pouring off liquids. *b,* smaller elliptical bowl with end handles (1, 1) projecting outward and no groove; flat rim; convex outer surface (3); bottom (4) flat without legs. *c,* bowl apparently elliptical, handle (1) appears to project upward from rim instead of outward; four-sided legs (2); carving (3) of lozenges cut out of wood and narrow raised borders between contiguous lozenges on outer surface; diameter, 11.25 inches; height, 4.5 inches. *d,* oval bowl, handle (1) projects upward from wide end and narrow end (2) has groove cut below rim surface to form spout; no legs; length, 14.5 inches; width, 11 inches; height, 4.5 inches. *e,* flat elliptical bowl, handles (1, 2) project outward, left handle (1) formed of double projection; length, 20 inches; width, 10.25 inches; height, 3 inches. (Bowls *c-e* in British Museum, after Edge-Partington.)

appears to be elliptical instead of oval, and it has four-sided legs. Bowl number 3 (fig. 19, *d*) he describes: "Oval bowl with end scooped out for pouring." The narrow end of the bowl is shaped after the beaker type of bowl seen in Cook Islands, with a groove cut below the rim surface to form a spout. Bowl number 4 (fig. 19, *e*) he describes: "Flat oval bowl 'Cuvette à eau', carved out of wood resembling satin wood and inlaid with discs of pearl shell." Wooden bowls were used as containers in which *puraka* and *uto* preparations were pounded. They were also necessary for the cooking of some food preparations, especially those which were heated or cooked by dropping heated stones into a liquid. Round bowls for coconut cream (*roro*), characteristic of Tongareva, are absent.

Hand graters (*tuai*) made of pearl shell are still in everyday use, due to the extensive use of unripe coconut as food. The soft coconut flesh is better dealt with by the hand grater than by a stand grater. The hand grater (fig. 20) is shaped somewhat like a European shoe horn. The part of the shell toward the hinge forms the grip, and the part toward the free edge forms the cutting edge. The grip end may be pointed or rounded and in the long graters may include a portion of the shell hinge. The curved grating edge is sharpened by grinding down the back of the shell, and it may be plain or serrated. The women are very expert in the use of the hand grater. By altering the pressure they make the grating fine or coarse. In addition to grating coconut flesh, the implement is used to grate the edible soft husk and also the *uto,* absorbing organ of the coconut. (For types, see pl. 1; fig. 20.)

The stand grater (*kautuai*) was used to grate the mature coconut in preparing coconut cream and obtaining coconut oil. It evidently resembled the Tongarevan stand grater in which a piece of coral was lashed to a wooden limb. The Cook Islands type of stand grater with a serrated metal grating edge is now in common use.

Another form of grater was provided by a block of sharp coral (*punga taratara*), on the rough surface of which raw *puraka* was rubbed to procure the grated form necessary in a particular food preparation and *takataka* oil.

The rough skin from the tail of the ray fish (*hiku whai*) was also used as a grater. A wooden scraper was used to detach the flesh from the keys of the ripe hala (*Pandanus*) fruit, but no specimen was seen. The combined wringer and strainer (*kainga*) was made from the pounded husk of the *ni mata* stage of the coconut. The *kainga* was used in expressing the coconut cream from the grated mature nut. The sheets of the fibrous textile-like stipule (*kaka*) at the base of the growing coconut leaves was also used as a strainer, especially in the preparation of coconut oil.

Pounders (*reru*) were rendered necessary by the presence of the *puraka,* which was mashed in certain food preparations. The *uto,* though fairly soft

when cooked, was also mashed in the *oveke* preparation. The pounder (pl. 1; fig. 21) was made of wood in the general form of a potato masher with a narrow neck and a terminal knob. The food was pounded directly in a wooden bowl without the intervention of a special pounding table (*papahia*) such as was used in Cook Islands. Pounders of coral were not made.

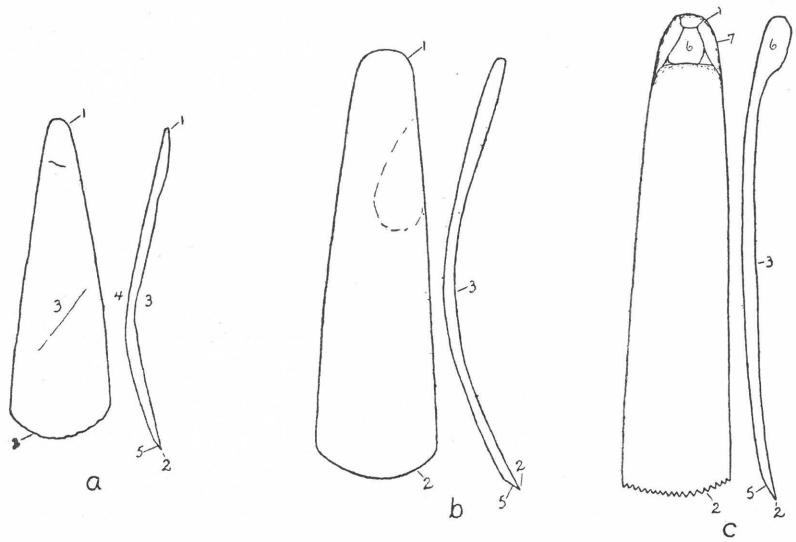


FIGURE 20. Pearl-shell hand graters (*tuai*). *a*, front and side views of short grater (C. 2788) with pointed grip, thick hinge part of shell not used: 1, pointed grip end; 2, cutting edge, serrated but worn through use; 3, longitudinally concave front surface of nacreous inner coating of shell; 4, convex back, outer shell surface ground to remove roughness; 5, posterior grinding of cutting edge; length of grater, 4.3 inches; width at lower end, 1.3 inches; greatest thickness, slightly more than 0.1 inch. *b*, front and side views of long grater: 1, grip, rounded; 2, edge, smooth; 3, marked front longitudinal concavity; 5, posterior grinding; length of grater, 5.7 inches; width at lower end 1.6 inches; width at upper end, 0.7 inch; greatest thickness, 0.2 inch. *c*, front and side views of long grater with part of thick hinge included: 1, thick upper end; 2, serrated edge; 3, front longitudinal convexity, not marked; 5, posterior grinding of cutting edge; 6, thick hinge included because of extra length of grater, ground down on front surface; 7, point at which hinge part is 0.7 inch wide; length of grater, 6.5 inches; width at lower end, 1.4 inches; thickness of hinge, 0.4 inch; thickness of blade, 0.2 inch.

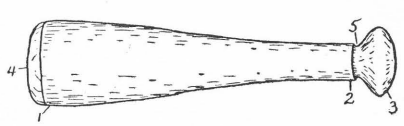


FIGURE 21. Pounder (*reru*) made of *ngangie* wood (C. 3020), rounded, with fairly equal diameters: 1, greatest diameter at base, 2.8 inches; 2, neck, diameter, 1.2 inches; 3, knob, diameter, 2.3 inches; 4, base, flatly convex; 5, groove between knob and neck to take supporting cord by which implement may be hung up, probably modern, due to metal nails or hooks in kitchen; length of pounder, 13 inches.

Special containers for *puraka* were plaited from coconut leaves to hold mashed and grated preparations for consignment to the cooking oven. These *raurau* and *pite* containers are described on pages 114-118.

The coconut husker (*ko*) was a pointed stick driven into the ground like the common Polynesian type of husker. The short husker held between the feet by the Tongarevans was not used. As the green husk at the base of the nut in the early stages of growth was used for food, it is probable that different methods of husking nuts prevailed as in Tongareva (29, p. 117), but details were not procured.

A short piercer (*ko poto*) made of a sharpened piece of *ngangie* wood was used to pierce the *ni mata* nut for drinking. This was used in the plantations and obviated husking the nut. The nut was held close to the face; the piercer was driven through the *mokomoko* butt end of the nut. As the piercer was removed the mouth was quickly applied over the hole, for the liquid spurted out and was likely to be wasted. The method of drinking (*mokomoko kiri*) was not without danger. The movements had to be so quick that, with the face held close to the nut, the exact site for stabbing was judged and not seen. Sometimes judgment erred and the cheek was stabbed instead of the nut.

Climbing bandages were used to assist in ascending coconut trees to pluck the nuts. Two forms are now in use:

1. Common *tari* bandage. This bandage is obtained from material stripped from the leaf of young growing plants which throughout the plantations have sprung from self-grown nuts. A leaf from the outer side of the closed central leaves (*rito*) is torn off, and the skin from the upper surface (*aro*) of the midrib is peeled off from the smooth part below the first two leaflets (*puwha*). About six strips (*tari*) 3 feet long are beaten against a tree trunk, chewed, and rubbed between the hands to render them soft and pliable. The ends are tied in a reef knot to form a closed loop about 16 inches long. The band is slipped over the dorsum of each foot and gives the climber a purchase against the palm trunk as he straightens his knees and seeks a higher grip with his hands.

2. *Kaha-piki* bandage (*kaha,* sennit braid; *piki,* to climb). The bandage is made of a length of sennit braid wound loosely into five loops about 16 inches long when pulled taut. The braid ends are knotted together and seized for a few turns around the five strands at the knot.

The carrying pole (*amo*) was formed of a convenient length of coconut leaf midrib. No shaped wooden poles were seen in use.

Flesh Foods

In the absence of cannibalism and many flesh foods, the proteid part of the diet was based on fish and shellfish augmented sometimes by wild fowl.

Fish were plentiful within the lagoon and in the deep sea. They were caught by a variety of methods (see pp. 158-194). Certain fish were

eaten raw as a change in diet and because the taste was appreciated. The general routine, however, was to cook them in the earth oven. When the sea and season were favorable, the people fared well. When, however, the sea was rough for some time in particular seasons, want of a flesh complement (*ninaki*) to eat with the vegetable food was felt. On such occasions the *Takai-whakaheo* chiefess was called upon to exercise her power in calming the sea to enable the hungry fishermen to supply the larder. Cooked fish left over from meals were dried and kept in baskets for future use.

The waters of the outer lagoon were rich in crayfish, which were caught at night by torching and formed an important addition to the diet. They were cooked in the oven.

Two species of land crab, the *tupa* and the *koveu,* are plentiful, but the *koveu* (coconut crab) was more sought after. Certain islands were closed until the *koveu* were plentiful, when the restrictions were removed. Motungangie was opened for our party. We went crabbing at night with torches of dry coconut leaves. The ground was damp from rain, and the crabs, bloated, purplish objects with powerful claws, were found out of their holes, resting on tree trunks. We procured a large number by picking the crabs from the tree trunks or poking them down with the torch or a stick when out of reach. The natives grasp them behind the claws and then tie them with strips of bark or *tari* so that their claws are pinioned. The crabs are cooked in the oven. The huge claws contain a delicate flesh, but the rich fatty material in the round bloated part is considered the best portion. It is very rich and oily, but palatable. On account of the oil, I should imagine that the *koveu* supplies an important addition to the atoll diet.

The inner lagoons in both atolls were rich in pearl oyster (*parau*) and *Tridacna* (*pahua*). The *Tridacna* formed an important food supply and were eaten either raw or cooked in the oven. *Tridacna* were also strung on strips of *tari* after cooking and dried in the sun to form a reserve supply. When dried, *Tridacna* become as hard as leather and keep for a considerable time. After they are recooked in the oven, they become soft again. We found *Tridacna* a useful change while on Rakahanga. The women of our household were eager to get us a supply when we expressed the wish. The *Tridacna* were of medium size and were obtained from the sandy bottom of the inner lagoon in comparatively shallow water. Almost every household had strings of dried *Tridacna* hanging up in the cooking house. In eating raw shellfish, a certain amount of salty liquid which satisfies the craving for salt is ingested. Other smaller shellfish are found in smaller quantities and are collected by the women.

Turtles were caught and cooked, but did not seem to play as important a part in the marae ceremony as they did in Tongareva.

All wild fowl that could be caught were grist to the mill. The man-of-war hawk (*kotaha*) and the brown booby (*toroa*) were caught at night on their rookeries. A strip of coconut midrib skin (*tari*) tied in a running noose was attached to a handle of *ngangie* wood. The stiff *tari* material kept the noose open. The birds roost on low *tauhunu* bushes and along the leaves of coconut trees. On the low plants, they were easily reached with the noose. The higher coconut trees were climbed by the fowler, and birds within reach were caught both by hand and by snare. The coconut leaf was bent down, which caused the birds farther out to climb up toward the butt, when they came within reach. The *kotaha* colored white on the neck under the bill are termed *kotaha mari* and those colored red, *kotaha tarakura.* Two smaller seabirds, the *ngoio* and *rakie,* were also caught.

Other birds were caught with set snares or killed with stones (*pehi ki te toka*). The snares consisted of running loops of coconut husk fiber arranged in rows on sticks with the loops directed upward. Barriers were made on opposite sides of the set snares to force the birds to pass through the snares as they moved about on their quest for food. The birds said to be caught in the snares were the *torea, kihi, parauanga, kururi, rahurahu,* and *moiho.*

Vegetable Foods

VARIETY

The vegetable food supplies consisted of the coconut, the *puraka,* the fruit and tips of the aërial rootlets of the hala (*Pandanus*), and the fruit of the *nenu* (*Morinda citrifolia*) which was used as a flavoring agent with one of the food preparations.

THE COCONUT

The coconut was introduced by Huku and planted by successive generations, so that at the present time all the islands are thickly covered by coconut groves. Many of the trees have been self-planted and there appears to have been no particular system followed.

The green nuts were plucked from the trees as required by the owners. The mature nuts that fell to the ground were gathered in heaps and removed as required. A heap of nuts (*komua*) belonged definitely to the owner of the trees, as expressed by the phrase, "Te komua ni nei na Tuteru." (This heap of coconuts belongs to Tuteru.) A large heap is termed *whetomo,* but the term is sometimes loosely applied to a small heap.

In removing nuts, a strip of husk was peeled down, leaving one end attached. By means of the strip, the nuts were tied together in pairs. The

connecting strip of husk was termed a *whakahani* and the term was used in counting the nuts in pairs as follows:

E tahi (1) whakahani =	2
E rua (2) whakahani =	4
E teru (3) whakahani =	6
E ha (4) whakahani =	8
Purupuru whakahani =	10
Purupuru ma tahi whakahani =	12
Purupuru ma rua whakahani =	14
Purupuru ma teru whakahani =	16
Purupuru ma ha whakahani =	18
Takau =	20
Rau =	200

The coconut tree is termed *ni,* the leaves, *nikau,* and the textile-like stipule at the base of the leaf, *kaka.* The flower is first inclosed in a small sheath (*poepoe*), from which an inner sheath (*taume*) emerges. The *taume* grows to a much greater length than the *poepoe.* From the *taume* emerges the flower (*roro*), which consists of a main spike with a number of smaller spikes. The secondary spikes have a number of male flowers (*pua ni*), with one female flower (*huariri*) at the base of each secondary spike. When the female flower has been fertilized and commences to grow, the male flowers with the main and secondary spikes dry up, and, still under the term *roro,* are used as firewood when the nuts are removed. The long boat-shaped *taume* also dries and is used as firewood. The growing stipules are cut off for use as strainers for coconut cream, and dry stipules are used as kindling for the fire generated with the fire plough.

The nut is contained within a thick envelope of husk (*puru*) which is covered by an outer skin (*kiri*). Nuts in the green stages (*ni mata*) are classified into two kinds, those in which the husk has a sweet taste (*mangaro*), and those which are not sweet (*kawa,* bitter). The husk of the green nuts is soft and contains a certain amount of moisture, whereas that of the mature nuts is hard and dry. The *mangaro* husk, owing to its sweetness, is used as food. It may be chewed raw like sugar cane to extract the sweet juice, or it may be cooked. When eaten raw, the husk is removed in segments with a husking stick and the outer skin (*kiri*) is peeled off. The term for chewing is *ngaungau,* but chewing *mangaro* husk receives the special term, *kopani.* To cook the husk, the nut is cooked whole without husking. The husk is then removed and chewed. The fluid contained within the nut may be drunk in the ordinary way.

The husk at the base or stalk end of the green *ni mata* stage contains less fiber and more parenchymatous material (*mokomoko;* Tongarevan, *karisi*) which is utilized as food. The green nuts are husked in such a way as to leave the *mokomoko* end still attached to the shell. The outer end which carried the stalk is broken off, and the *mokomoko* material is scraped off in small pieces with a hand grater to be mixed with dishes prepared from the grated nut. The material has a slightly bitter taste and thus provides a flavoring agent, as in Tongarevan cookery. In the later stages of growth, the *moko-*

moko is invaded by more fibrous material and becomes too hard and dry for food.

The nut, as it develops, contains a fluid within the nut cavity which at first is too bitter to drink but which in the green nut stages forms a cool, refreshing beverage. The fluid also enters into the composition of dishes made from the grated flesh. In the mature stages of the nut the fluid becomes too bitter for use and is gradually absorbed by a part of the growing embryo and diminishes in quantity until it entirely disappears. The various stages of the nut are distinguished not only by external appearance, but also by shaking the nut to determine by the sound and feel the quantity of fluid present.

The fluid appears in the earliest stages before the flesh. The flesh then appears at the base end of the shell as a thin, slimy layer (*havarevare*). In the *ni mata* stages of growth, the flesh completely covers the interior of the shell and gradually thickens and becomes firmer. In this condition, the flesh is grated and utilized in various dishes. When the *hakari* stages are reached, the flesh assumes its maximum thickness and hardness and is still used as food. From then on, two courses are open. If the embryo grows, it gradually absorbs the flesh until only a thin, hard layer is left. If it does not grow, the flesh remains thick, hard, and well preserved. It shrinks slightly from the shell, and the loosened flesh rattles within the shell when the nut is shaken. This preserved form provides a useful reserve food.

The embryo develops in the flesh at the base of the nut. One part grows out externally through the patent eye of the shell base to form the root, stem, and leaves of the growing plant. Another part appears as a rounded protrusion (*mata uto*) at the base of the cavity. This is the growing absorbing organ which gradually fills the cavity with a soft, spongy mass (*uto*). The *uto* is edible raw or cooked and forms a welcome variation from the ordinary flesh of the nut. The *uto,* in expanding, absorbs all the remaining fluid, and unless used at the stage when it fills the cavity, it will gradually absorb the mature hard flesh with its contained fat crystals.

The coconut provides food from the husk, flesh, fluid, and *uto* which are present in different stages of growth. The particular stages of growth were thus of the greatest practical importance. The individual was not forced to make the food preparations from a haphazard collection of nuts, but he selected his nuts for the particular dishes that he desired. Experience had taught him exactly what parts of the nut were still edible in the nuts that he saw growing on the trees. Accumulated knowledge led him to recognize the different stages from their practical value as food. From the female flower to the nut only fit for planting, thirteen names distinguish the stages of the coconut growth (Table 15).

Table 15. Stages in Growth of the Coconut

1. Huariri	Female flower.
2. Mokomoko puapua	Small, no flesh.
3. Havarevare	Flesh starting to grow; thin, slimy.
4. Ni mata mua Ni mata muri	Thin flesh covers interior of shell.
5. Ni mata matua	Flesh thicker.
6. Ni momoto	Shell darker, flesh mature. Slight rattle of fluid.
7. Hakari kahatea	Flesh thicker, fluid rattles more.
8. Hakari uri	Flesh hard (copra).
9. Takataka	*Hakari uri* kept in house, fluid dries, flesh loosens from shell and can be rattled, hence *takataka.*
10. Mata uto	Commences to sprout, absorbing organ shows at base inside, fluid not all dry.
11. Uto pine	Cavity filled with *uto* (*pine,* filled up), no rattle. *Katinga* flesh still present. *Uto* may be eaten and flesh made into copra.
12. Uto puni	*Katinga* thinner and harder, too hard to eat. More *uto* but too tough. Kept too long, only fit to grow.
13. Purapura uri	*Uto puni* when planted.

The flesh can be eaten uncooked at any stage from the thin *havarevare* to the hard *takataka* and the *katinga* of the *uto pine.* The fluid is drunk from the *havarevare* to the *ni momoto* stages. Out in the plantations where the nuts are opened for drinking, the flesh is generally eaten on the spot, or the nut is carried home for a later meal. In the earliest stages, when the flesh is thin, it is readily removed from the shell with the fingers. From the *ni mata muri* stage, it is customary to grate the flesh with a hand grater (*tuai*). The slices of flesh removed may be made fine or thick by altering the pressure on the grater. To grate finely is termed *varuvaru,* and to remove in coarser slices is *tupere.* The finer grating is used with the soft-fleshed *ni mata* stages and the coarser grating with the firmer *ni momoto.* Hence the following chant or *pese:*

Tupere au te ni momoto,	I grate the *ni momoto* coarsely,
Maroro au,	That I may be strong,
Ki te kopu,	That the stomach be filled,
Pakari te waewae,	The legs strengthened,
Matutu te kopapa.	And the body fattened.

Before a green nut is grated the fluid may be poured out into another shell, and the process of grating is then termed *varuvaru maro* (dry grating). In some preparations a little of the fluid is drunk to prevent spilling, and the grating process with the rest of the fluid in the shell is termed *varuvaru tavai* (wet grating).

The grated flesh of green nuts with the fluid retained (*whakaehu*) forms the basis of a number of preparations. The grated flesh of green nuts

without the fluid is termed *takarari.* When mixed with other food such as hala or *puraka,* the term *pana* is used to denote the mixture, but the actual mixing process with two grated foods is *kahiro.* When required, the liquid contained in the grated nut is squeezed through a stipule strainer. The remaining dry flesh is termed *ota.*

The mature *hakari* flesh is eaten (*ka ngaungau te katinga*). The fluid is apt to be bitter and is never sought after as a drink, though it may be used with the flesh. The Tongarevans do not drink it.

The *takataka* nut has three recognized stages: *takataka maimaeha,* in which the flesh is still completely soft; *takataka whati,* in which the flesh hardens but has not changed color; and *takataka kura,* in which the flesh darkens and turns somewhat reddish (*kura*) after being kept some time. The *takataka kura* is regarded as the best form for eating. The flesh is eaten without any special preparation. The thin inner part left after rubbing off the outer part for oil on sharp coral or ray skin is termed *uhio* and is eaten. The hard nut is eaten with dried fish, dried *Tridacna* (*pahua maro*), and *puraka.* A person with a large stock of *takataka* used it as a medium of exchange for fish.

The *uto* stages of the nut are, of course, known by the presence of the growing plant projecting from the base of the unhusked nut. When the nut is unhusked it is termed *uto kiri* (*kiri,* skin), and when husked it is *uto ko* (*ko,* to husk). The growing part is jerked off (*huhuti*) from the outside. A part left attached to the *uto* is called the *pito* (navel) and is removed (*huhuti*) after the shell is opened. To open the husked shell is *kohoa* or *whowhoa.* The end of the *uto* toward the base of the shell is the *mata,* as it is near the *mata* hole in the shell. The other end is the *take.* To cut in pieces is *tehi,* as in *tehia mai na uto* (to cut up the *uto*). Several preparations are made with the *uto.*

The *uto puni* is used medicinally but is of no use as food. The Manihiki-Rakahangan people considered it too tough; but as they had the *puraka,* they did not have the same incentive to experiment with pitting the *uto* as the Tongarevans, who had to rely on the coconut alone.

PURAKA

The *puraka* species of taro was extensively grown on both Manihiki and Rakahanga. Large areas had been excavated, especially on the island of Rakahanga, so that the level which was well below the surface reached the brackish water beneath. The large plots must have entailed considerable community labor, for the areas so dealt with are quite extensive. The spoil has been thrown out so long ago that it has formed natural-looking mounds and ridges at the sides of the excavations. These mounds on Rakahanga

form the highest part of the island, and it is here that the people retire to avoid the high tidal waves that inundate the land during some of the severe hurricanes. When the mature *puraka* was dug up for food, the top of the leaves termed the seed or *puraka purapura* was replanted. The tubers were then pitted in a damp place in the sand near the cookhouse for use as required. The presence of the *puraka* gave the people a great advantage over the atoll of Tongareva, which the *puraka* never reached in pre-European times. A number of preparations were made from it.

HALA (PANDANUS)

Hala fruit is eaten raw when ripe, or it may be cooked on the stones of an oven without covering. Hala gratings were also dried and kept as reserve stock.

FOOD PREPARATIONS

1. *Whakaehu mata.* The grated flesh of the *ni mata muri* coconut is eaten uncooked (*mata*) by itself after drinking the fluid of the nut or with the fluid mixed with it. As a flavoring agent, the grated husk (*mokomoko*) from the base of a green *mangaro* nut may be mixed with it.

2. *Wai-tahi.* The grated material of the *whakaehu mata* may be cooked in an oven in its own shell by itself or with the husk flavoring. The preparation is then termed *wai-tahi.*

3. *Whakaehu pana puraka.* The *puraka* is cooked whole and the *whakaehu* preparation made from *ni mata muri* is eaten with it. It is really a combination and not a single preparation.

4. *Takarari.* The flesh of the *ni mata muri* is grated dry and worked (*oi*) with the hands. The difference between it and *whakaehu* is simply that of fluid. Both are eaten uncooked.

5. *Verovero puraka.* The *ni mata muri* is wet-grated and raw *puraka* is cut into thin slices (*tipu rahirahi*). A layer of grated coconut is placed in the bottom of a coconut shell and alternate layers of coconut and *puraka* made until the shell is filled. The mixture is then cooked.

6. *Romanga.* The full name of this mixture is *whakaehu pana ota romanga.* As the name implies, the grated green coconut flesh (*whakaehu*) is mixed (*pana*) with the dry gratings (*ota*) left after expressing the oil from the grated mature nut (*hakari*). The grated mature nut is treated with heated stones to bring out the oil. The mixture prevents waste and supplies the *whakaehu* with a different flavoring agent.

7. *Whakaehu pana nenu.* The ripe fruit of the *Morinda citrifolia* (*nenu*) is squeezed in a wooden bowl with the hands to express the juice. The fluid from a green nut is poured in over the fruit to assist the extraction of the juice, as the fruit is fairly dry. The flavored fluid is then put in the empty shell of a green nut with the shell cover over it and cooked. The cooked mixture will remain good for two days. This is used as a flavoring agent with the *whakaehu* preparation of uncooked grated green nut (*ka kahiro ki te whakaehu*).

8. *Tupere.* The apical end of a *ni mata matua* is cut off, some of the fluid drunk, and the flesh wet-grated in coarse pieces. It receives its name from the coarse grating (*tupere*) as compared with the finer grating (*varuvaru*) of the *whakaehu* preparations which are made from *ni mata muri* or *ni mata mua.* The *tupere* preparation is largely used by nursing women to increase the milk flow, for which it is said that the *ni mata muri* of the *whakaehu* preparations is useless. *Tupere* is also used as a food complement (*ninaki*; Maori, *kinaki*) with fish.

9. *Pana mokomoko.* The *ni mata mua* is finely wet-grated, and the gratings of the *mokomoko* husk of a green bitter nut

(*ni kava*) are mixed with it. The mixture turns reddish in color. The *moko-moko* by itself is bitter, but when mixed with the grated coconut flesh it turns sweet.

10. *Huripaka.* The flesh of a *ni mata matua* is dry-grated with the husk of a green sweet coconut (*ni mangaro*). The two are mixed, placed in a specially made coconut leaflet container (*raurau*), and cooked in an oven. The cooked preparation is very dark in color.

11. *Puraka pana ota.* Cooked *puraka* is pounded (*tukituki*) and mixed with the coarsely grated flesh of the *ni momoto.*

12. *Wai ta.* The grated flesh of a *ni momoto* with its fluid is put into a wooden bowl and mixed with grated husk of a green bitter nut. The mixture is then squeezed through a strainer to separate the flesh. The strained fluid is termed *wai ta* and is used medicinally by adults for pain in the back. The dry *ota* flesh is used for the *puraka pana ota.*

13. *Roro.* The *roro* is the creamy fluid from the mature nut grated on a stand-grater and expressed through a stipule strainer. The cream may be used uncooked (*roro mata*), or a hot stone may be dropped into the bowl to heat it (*roro hehengi*). The *roro mata* may be used as a laxative. The preparation did not assume the social importance that it did in Tongareva, and no special bowls were made for it.

14. *Uto kai mata.* The *uto* is cut up and eaten raw.

15. *Uto tupere.* The opened shell is held in the hand and with a hand grater the *uto* is coarsely grated within the shell, as is *katinga* flesh. The two are mixed with the hand grater, which also acts as a spoon in conveying the mixture to the mouth. The person does not wait to grate the whole quantity but eats as he grates.

16. *Turu uto.* The *uto* is cooked in the shell in the oven. The *mata* ends are cut off with a hand grater and eaten by the family. The other ends are arranged around cooked *puraka* in the middle of a bowl and conveyed to the eating place (*whainga*) where guests are assembled.

17. *Uto haehae.* The uncooked *uto* is shredded (*haehae*) with the fingers, placed in a bowl, and the grated hard flesh of the nut is strained over the shredded *uto.* The fluid is very oily.

18. *Oveke.* Cooked *uto* is pounded (*tukituki*) in a wooden bowl and the grated mature flesh of the nut is mixed with it.

19. *Pitei.* A *ni mata* nut is dry-grated, put in a *pite* (coconut leaf container) and cooked in the oven. The *uto* is also cooked in the shell and afterwards pounded in a wooden bowl. The cooked coconut gratings (*takarari*) are mixed with the pounded *uto,* and the resulting mixture is *pitei.*

20. *Pupu.* Cooked *puraka* and *uto* are pounded and the *takarari* preparation from *ni mata* is prepared. The directions are as follows: "Oti, kua pana te puraka ki te uto, kua pana te takarari ki te puraka e te uto. E teru mea kua pana." (When finished, the *puraka* is mixed with the *uto,* the grated coconut is mixed with the *puraka* and the *uto.* Three things are mixed.) "Raranga te raurau kapukapu. Kua hua ki roto, kua ruruku. Kia pu te umu, kua to. Huke ake, kua kai." (Plait the *kapukapu* basket. Place within and fold up. When the oven is ready, cook. Open up the oven, eat.)

21. *Uto whakapapa.* The cooked *uto* is placed on a piece of *katinga* (hard flesh of the nut) and the two are eaten together, just as one would eat bread and butter.

22. *Puraka mata.* The *puraka* is eaten uncooked.

23. *Puraka to.* The *puraka* is scraped to remove the skin and cooked in an oven. It is eaten with *uto,* hard coconut, and fish. It is also dipped into *roro.* The *puraka* is grated on a coral slab to provide a number of dishes. When grating, the slab is placed on a *kurei* mat made of coconut leaflets so as to catch the grated material.

24. *Papa puraka.* The grated *puraka* is mixed with coconut cream (*roro*) and folded up in a *puraka* leaf. This is placed in the oven, with the end of the folded leaf below to prevent the parcel's unraveling. The cooked preparation is *papa puraka.*

25. The raw grated *puraka* is kneaded (*oi*) with the hands in a wooden bowl, placed in a *pite* (container made of coconut leaflets), and cooked. Sometimes only the outer parts of the *puraka* are grated off, when the preparation is termed *oro,* and the middle inner part (*tahi*) is cooked separately in another *pite* container. (*Pite ke to ti oro, pite ke to ti tahi*). When cooked, both the *oro* and the *tahi* are put in a wooden bowl, coconut cream is poured over them, and the contents of the bowl are stirred up and mixed (*karo*) with a piece of coconut midrib or a wooden pounder. The heat brings out the oil in the cream and the preparation is exceedingly sweet. (*Kua mea te hinu, kua none whakarere*).

26. *Poke.* The raw grated *puraka* is kneaded with the hands in a bowl and then placed on a plaited coconut platter termed a *papa.* The material is placed near the midrib edge and the far edge of the *papa* is folded over and tied. When cooked, the *puraka* is again kneaded and stirred up in a bowl, as the under part is somewhat harder from its position on the heated stones. The cooked *puraka* is made up into balls (*popo*) about the size of oranges. Heated coconut cream (*roro hehengi*) is then spread over the balls. The preparation is termed *poke.*

27. *Mahu.* The raw *puraka* is pounded. A receptacle is formed by placing a close *kurei* in a coconut leaflet basket (*kete*). The *puraka* is placed within and the *kurei* folded (*whatuwhatu*) over it. The basket is closed (*tia*) with two-ply twisted sennit (*whauhoto*) and laid aside (*ka tuku ki waerenga*) until the *puraka* becomes soft (*whakape*) and emits an odor (*haunga piropiro*). When required, some is taken out, kneaded in a bowl, placed in a *pite* (container) and cooked. When cooked, it is served with coconut cream. The food is fermented in the same manner as breadfruit but is kept in a closed basket instead of a pit.

28. *Whakarikoriko.* The *puraka* is pounded raw, placed in a large coconut shell container (*ipu*) with coconut cream, and cooked.

29. *Verovero.* The *puraka* is cut into very thin slices. Commencing with the *puraka,* alternate layers of *puraka* and grated coconut (*whakaehu*) are used to fill a coconut container. A topmost layer must be of coconut to prevent the *puraka* from becoming too hard. When cooked, the slices of *puraka* are removed with the layer of grated coconut above it and both are eaten together.

30. *Puraka whakapara. Puraka* is cooked whole in the oven and while still hot is placed in baskets which are closed with ties (*tia more*). All is laid aside until the *puraka* is dark, when it is recooked after any mould that may have appeared has been washed off. When being eaten, the *puraka* is dipped in coconut cream. The preparation is sweet.

31. *Turoro. Puraka* is cut very thin (*kotikoti rahirahi*) and laid in a coconut shell container. Coconut cream is expressed over the sliced *puraka.* The oven stones are covered with the husk (*kainga*) of the *ni mata.* The vessels are placed upon the husk and the oven closed. When cooked, the preparation forms *turoro.*

32. *Popo puraka.* Cooked *puraka* is pounded and mixed with heated coconut cream in which the oil is brought out.

33. *Turu puraka.* Large-sized *puraka* called *tahua* are cooked, placed in a wooden bowl with the larger ends uppermost, and heated coconut cream is poured over them.

34. *Reru.* The *puraka* is cooked whole and pounded after the skin is peeled off (*teretere*). Heated coconut cream is mixed with it and the mixture rounded off (*popo*) into dumplings. The separate dumplings are placed on pieces of *puraka* leaf which are brought together at the top and tied. They are then cooked and served.

35. *Puraka pana whakaehu.* The pounded cooked *puraka* is mixed with grated green coconut (*whakaehu*).

36. *Penu whara.* The keys of the hala (*Pandanus*) fruit are pounded off the central core, and the inner soft ends are grated on a special instrument into a container. The *penu whara* is sweet-smelling as well as palatable.

Fats and Oil

The need for fat in the diet was evidenced by the fondness of the people for fatty foods. During the seasons when certain fish were fat, they were eagerly sought after. The oily part of the *koveu* (land crab) and the fat of the sea birds assisted in providing the necessary ingredients to the diet. An ever-present source of fat was the coconut, the mature flesh of which contains abundant fat crystals. The fat crystals were available not only in the mature flesh (*katinga*) but also in the coconut cream expressed from the grated flesh. In some food preparations the oily flavor was brought out by heating the coconut cream with hot stones. The *uto* (absorbing organ) also absorbs oil from the mature flesh and thus supplies it to the diet. Even in the preparation of coconut oil, the burned, grated material, after being strained and squeezed, is not wasted but is used in the food preparation known as *romonga*. As the coconut formed the staple food, it may be said that the atoll diet was fairly rich in oil.

Coconut oil was used medicinally and also for rubbing over the body. Three forms of oil were prepared:

1. *Hinu takataka.* As the name implies, the oil (*hinu*) is obtained from the mature nut (*takataka*), the flesh of which is very oily. It is obtained by chewing the flesh, and the chewed material is rubbed over the head and body. This is especially done by young people to render themselves attractive in the evening after the labors of the day have ended. Any extra material left over is put in the body belt (*taoa*) by young adults going out to keep love appointments (*whakaturi*).

The *takataka* oil is also prepared by grating the flesh on a slab of sharp coral or on the skin from the tail of the ray fish (*hiku whai*). The quantity required is small and is used immediately after its extraction from the grated nut. To rub is *ukui*, but the special grating process with the *takataka* nut is termed *puoro* or simply *oro*. The oil is contained, for the most part, in the middle of the flesh. As the pieces of flesh detached from the shell are ground individually, it is customary to rub off the outer and middle layers while the thin (*angiangi*) inner layer of flesh is being eaten. The oil may also be directly expressed by gathering up the gratings in a stipule strainer and squeezing the liquid through into a vessel. The oil may be kept in a coconut cup or container. This oil is also used medicinally.

2. *Hinu romonga.* The oil is procured from the hard flesh of the mature *hakari kahatea* and *hakari uto* nuts as well as from the growing nuts in the *mata uto* and *uto pine* stages. All these nuts are now used in making trade copra. The nuts are grated on a stand grater (*kautuai*) and the gratings fall on a *pataro* mat spread below. The gratings (*ota*) are exposed to the sun on the mat and turned now and again until the oil begins to show. This process is termed *haumake*. The mats are then drawn into the shade to prevent the grated material from becoming too hard. Stones heated in the oven are lifted with *pingohi* tongs, placed on the gratings, and the material at the sides is heaped up over the stones. The material is carefully watched and the stones are moved about to prevent the grated nut from becoming burned. When all is heated to the right appearance, it is transferred to a wooden bowl. The oil is expressed by squeezing (*tatau*) it through a stipule strainer into a coconut cup where it is allowed to settle. The grated material in which some oil still lingers is used as food in the *ro-*

monga preparation. The heating process is also termed *romonga* and gives its name to the oil.

3. *Hinu pipiro.* The oil is prepared by mixing the inner parts (*tutae*) of the *tupa* (land crab) with the grated nut prepared from the same stages of nuts as those used in the extraction of *romonga* oil. The mixture is wrapped in the leaves of the *whano, nenu,* or *puraka* and covered over in a basket, bowl, or coconut leaf. It is left for two or three days to become ripe (*para*), a state influenced perhaps by the decomposition of the *tupa.* The material is then heaped up on the two sides of the broad upper concave surface of the butt end of a coconut leaf. The oil runs down the middle clear space into a coconut shell container placed below. The shell full of oil is then stoppered for future use. It was stated that this oil was used for lamps after their introduction. Because of its unpleasant odor (*pipiro*), it was not likely to have been made for bodily use in ancient times. The dry gratings were eaten and the thick sediment in the oil was applied to ringworm (*hune*).

Feeding of Children

Children received careful attention from birth, and food preparations to suit children's ages were made from the coconut.

It was considered advisable to give a laxative to the baby after the cord had been cut, in order to get rid of what was termed the dark excreta. The laxative was obtained from the *uto pine* nut, which contains both the *uto* and the *katinga.* The *uto* and a little of the *katinga* were grated with a hand grater. The mixed grated material was squeezed with a stipule strainer to express the liquid into a coconut shell cup. A piece of the free end of an aërial hala rootlet (*kai whara*) was used as a teat and dipped into the fluid (*whakaoma*). The child was encouraged to suck (*whakaroroma*) the teat and thus absorb the laxative.

The child was not fed at the breast for three days. The colostrum milk of the mother (*mea renga,* yellow material) was sucked out by a friend during this period until the normal milk was established. During this three-day period the child was fed on *waita,* which consisted of the fluid expressed from a grated *ni momoto* nut, mixed with water, and squeezed through a stipule strainer into a coconut shell cup. The hala rootlet teat was used.

The child was fed at the breast entirely for four months, after which the breast milk was augmented by giving the child a little grated *whakaehu* made from the *ni mata* nut. This was continued until the child was nine months old. Variety was provided by mixing grated *uto* with the coconut *whakaehu.* The *uto* was carefully selected from those which had reached the right full size but had not become tough. Both the *uto* and the *ni mata* were finely grated and mixed together.

After the child was nine months old, the best food for it was cooked *uto* (*uto to*).

PLAITING

INTRODUCTION

Plaiting is woman's craft. It provides the technique by which many articles required in domestic life are made. The men are also skillful with their fingers and make thatch sheets and baskets that may be immediately required, but the production of plaited articles is essentially woman's work. The scope of the craft was wide when no form of weaving was in use. Certain articles of clothing were originally provided by plaiting. The advent of Western culture has affected the form of clothing, but all other plaited articles are as much in use today as they were in pre-European times. Plaiting has thus always been a live craft. It has recently been developed further by the making of more elaborate mats and satchels in lauhala (*Pandanus* leaf) and new types of fans and hats in prepared coconut leaf. The women of Manihiki and Rakahanga have established a wide reputation as skilled plaiters and far surpass their neighbors of Tongareva. The materials used, coconut leaf or lauhala, influence technique.

PLAITING WITH COCONUT LEAVES

PLAITED ARTICLES

The coconut provides a great number of plaited articles which are necessities in everyday life. For houses the coconut leaf furnishes an alternative thatching sheet and supplies wall screens. Within the house, coconut leaf mats form part of the necessary furnishings. A coconut leaf mat is also used to sit on out of doors and during certain ceremonials. The leaf supplies containers in which food is cooked, covers to retain the heat of the oven during cooking, and platters on which cooked food is served. A variety of baskets is made to contain foods and stored clothing. Last of all, the coconut leaf furnishes a shade to protect the eyes during operations conducted during the heat of the day, especially fishing for bonito.

THE LEAF

The leaf has received so much attention that the parts have been named for convenience:

nikau, full leaf
whani, main midrib
tua (back), upper shiny surface
aro (front), under surface
pihonga, under midrib surface
hikuhiku nikau, tip end of leaf
katuri, leaflet from tip end
rau papata } longer
patapata } leaflets
ruruku, bundle of leaflets
tuaniu, leaflet midrib

The naming of the two surfaces of the leaf has been reversed from that of Cook Islands. The skin of the midrib is used for rough lashings. The leaflets toward the butt end of the midrib become hard, brittle, and frayed, and most articles are therefore made from the leaflets toward the tip end of the leaf. Thus a woman requiring individual leaflets for a particular type of mat will say to an assistant, "Haehaengina mai na katuri." (Tear off the leaflets from the tip end of the coconut leaf.)

TECHNICAL TERMS AND METHODS

Below the attachment of the leaflet midrib to the leaf midrib the two sides of the leaflet are attached close together in a vertical line to the side of the leaf midrib. The leaflet is therefore folded together at its commencement but soon opens out into its full width.

To obtain a woven or plaited surface, two sets of elements have to be provided for interlacement. In plaiting, the two sets of elements are fixed at the same commencement edge; one set is turned diagonally toward the left and the other toward the right. Individual strips of material, or wefts, inclined toward the left are sinistral and those toward the right, dextral. The technique is as follows:

The plaiter sits on the ground with the commencement edge lying transversely toward her and works from left to right in a section of convenient depth. When she attains the depth of a working section on the left, she also defines the left margin of the section by successively turning in the sinistral wefts as they reach the left margin. By turning in the sinistral wefts at right angles to their previous course, she not only defines the left margin of the working section, but she turns the sinistrals back into the plaiting where they now incline toward the right and thus function as dextrals. From the method of beginning, the working edge of the section is on the right of the plaited portion and is inclined obliquely upward toward the left, being formed by the last sinistral weft crossed with a number of dextrals. A triangular section is built up on the left until the worker has a convenient number of dextrals engaged, usually six to eight. With each subsequent movement, a dextral and a sinistral are added on the right of the working edge. From its position, the new dextral is added to the lower end of the oblique working edge, and for convenience the worker drops the top dextral in the last movement so as to keep to the same number of working dextrals. The series of working dextrals is manipulated by the left hand into alternating sets, the arrangement of which depends upon the plaiting stroke used. In check plaiting, the left hand picks up every alternate dextral and leaves the others down. The raising of one set of alternate wefts forms a shed between the two sets in which the new sinistral is laid by the right hand. In the next movement the plaiter drops the top dextral altogether, as she will pick up a new dextral at the lower end of the working edge. Commencing with the upper end of the working edge, she successively drops the raised dextrals over the sinistral placed in the shed and also picks up successively the recumbent set of dextrals from beyond the right edge of the sinistral which lies upon them. In this way, the added new sinistral passes over one and under one crossing element throughout its course in the shed, and the plaiting stroke is thus a check. In covering the last sinistral, the two sets of working dextrals have been reversed in position and a shed provided for the next sinistral, which will continue the check technique. When the wefts pass under

and over more than one crossing element, the stroke is termed a twill. A twilled-two is formed by raising the dextral wefts at the working edge in alternate pairs and leaving the alternate pairs down. When the new sinistral is laid in the shed, it thus passes over two and under two crossing elements. To continue the twill, the technique demands that in the next movement one element of each raised dextral pair be kept raised and a pair provided for it by picking up an adjacent recumbent weft. Two courses are thus open. If the lower member of each pair is retained, the recumbent weft below it must be picked up. This will result in the rows of twilled-twos being horizontal in direction. If the upper element of each raised pair is retained, the recumbent weft above it must be picked up, and the result will be that the twilled rows will run vertically. To form twilled-threes, twilled-fours, and higher combinations, the number indicated is held up and a similar number left recumbent. In each subsequent movement, one of each raised group is dropped and a recumbent picked up to replace it. If the recumbent weft is picked up from below, the twilled row will run horizontally, and if from above, it will run vertically.

After establishing the technical stroke and the depth of the working section, the craftswoman works along the commencing edge from left to right by successive movements in which she drops the top working dextral, arranges the next shed, picks up a new dextral from below, and places a new sinistral in the shed. She is concerned with arranging the sheds and the plaiting stroke pattern develops automatically. On reaching the right margin, she successively turns in the dextrals as they reach the margin, and by bending them in to function as sinistrals she defines the right marginal edge. The defining of the right and left marginal edges is necessary with each working section of a mat. With baskets, the margins are not turned but are left free and oblique for subsequent treatment. Successive working sections are added until the required depth of the article is reached. The far or finishing edge is then completed, ordinarily by a three-ply braid.

Plaiting vocabulary used by natives:

Puwhera (open), open leaflet
Piri (stuck together), closed leaflet
Kohiti, check plaiting
To, prefix before number to distinguish twill
Torua, toteru, twilled-two, twilled-three
Whakatutu (to make standing up) toteru, vertical twilled-three (without qualification *toteru* refers to horizontal twills)
Peperu, to turn side margins
Hiri, three-ply braid
Take, free braid tail or corner
Huru, additional separate leaflets added to plaiting
Potiki, to narrow plaiting by bringing two wefts together to function as one
Hatu, to commence plaiting two leaflet-bearing strips
Tutaki, to close in ends of basket

COMMENCEMENT EDGE

When individual separate wefts are used, as with lauhala, a special technique is needed for joining the two sets of individual elements along a commencement edge. In the coconut leaf, however, nature has provided an established commencement edge in the leaf midrib on which the leaflet wefts are growing at regular intervals. The fixation problem was thus solved by nature. In the local development of the craft of plaiting to satisfy various

needs, the midrib, with rare exceptions, has been used as the fixed commencement edge, but the need for different types of plaited material has led to a diversity of treatment in utilizing the leaf midrib. The whole midrib may be retained and the leaflets of both sides used, or the midrib may be split and the leaflets of one side used. For better work, a thin strip sufficient to carry the leaflets may be carefully split off the main midrib and will thus form a neat commencement edge. Two or four of these midrib strips may be combined. The forms of commencement technique are as follows:

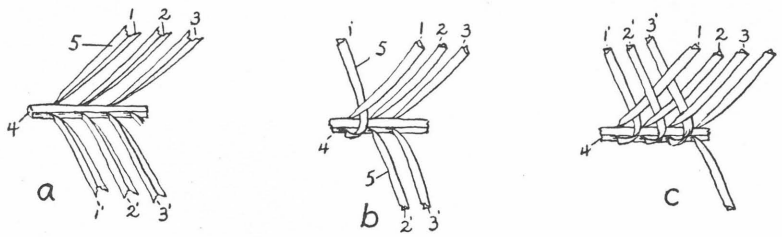


FIGURE 22. Whole midrib commencement. *a*, section of coconut leaf, butt end to left, natural upper shiny surface uppermost: in this position, leaflets of both sides naturally directed toward right; leaflets on far side (1-3) retain their natural direction as dextral wefts, and those on near side (1′-3′) will have to provide sinistral crossing wefts; leaflets shown with leaflet midribs (5) running down middle line; part near leaf midrib (4) narrow but opens out away from leaf midrib. *b*, in plaiting, leaflets kept closed so that leaflet midribs (5) are on right or side to which leaflets naturally directed; first near leaflet on left (1′) used as first sinistral, bent across leaf midrib (4) to pass under first dextral (1), and thus directed towards the left to function as sinistral; bent direct, without any half-turn, so leaflet midrib (5) of sinistral (1′) still remains on right edge of weft. *c*, next near leaflet (2′) makes direct bend across leaf midrib, passes under next dextral (2), and if a check stroke is maintained, passes above next dextral (1); third sinistral (3′) crosses over leaf midrib, passes under opposite dextral (3), over next dextral (2), and under next (1); in this manner, by direct bends, near leaflets cross over leaf midrib, under opposite dextral leaflets, and subsequent interlacing depends on stroke used.

1. Whole midrib commencement (fig. 22). A section of leaf for the required length of the screen is cut off. The section is laid transversely before the plaiter with the tip end toward the right and the shiny surface uppermost. In this position the leaflets on the far side of the midrib form natural dextral wefts. The opposing set of sinistral wefts is formed by turning the near set of leaflets over the midrib and bending them to the left to engage with the natural dextrals in the manner shown in figure 22. The leaflets are kept closed (*piri*).

2. Single-strip midrib commencement (fig. 23). The leaf section is cut to the required length and split down the middle. Only one side of the leaf is utilized, so the crossing wefts are provided by bending alternate leaflets in the opposite direction to their natural course. When only one article is required, the leaf strip with the leaflets directed naturally to the right is preferred as the leaflets form natural dextrals and plaiting can proceed from left to right in the orthodox manner. If the other strip with

the leaflets directed toward the left is used, the plaiting must proceed from right to left. As the bending of alternate leaflets in the opposite direction increases the inter-weft spaces, the open leaflet is used to diminish the spaces.

3. Simple two-strip commencement (fig. 24). The problem of supplying the second set of crossing elements has so far been met by twisting leaflets from the opposite side of a whole midrib or alternate leaflets from the same side of a single strip. A simple advance in technique is to split the leaf midrib and utilize both sides. When the strips are laid with the midrib strips together and the shiny surface of the leaflets up, the strip from the left side of the leaf provides a set of dextrals naturally directed, and the strip from the other side a set of naturally directed sinistrals. This obviates bending leaflets in the opposite direction to their natural inclination. The commencement of a food platter in check with the open leaflet is shown in figure 24. In such commencements, it is customary for the sinistral-bearing strip to be placed above the other.

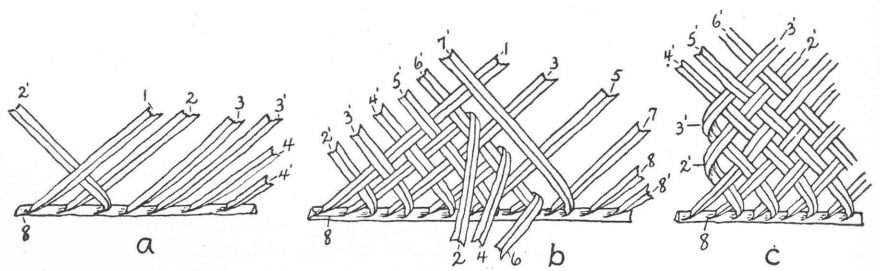


FIGURE 23. Single-strip midrib commencement. *a,* midrib strip (8) with leaflets directed naturally toward right, shiny surface up, is selected; leaving out first leaflet (1) on left, following leaflets dealt with in pairs, one on right being converted into sinistral by direct bend over its dextral pair on its left; thus, first sinistral is third leaflet (2′) from left, which is right member of first pair (2, 2′) and is bent to left over its dextral pair (2) on its left; purpose of leaving first leaflet (1) out of pairing is now obvious; as check stroke is used, first sinistral (2′) passes under it and is thus kept down in position. *b,* right hand members of subsequent pairs (2′-7′) have been converted into sinistrals by passing over dextral members (2-7) on their left, and each additional sinistral as formed is interlaced with preceding dextrals in check stroke; in working edge on right one set of dextral alternates (2, 4, 6) has been raised, and other set (1, 3, 5, 7) has been left down; next sinistral (7′) has been bent to take its position in shed formed; as working edge of 6 dextrals is enough, top recumbent dextral (1) will be left out of next movement; top raised weft (2) dropped over sinistral (7′); recumbent weft (3) raised; 4, dropped: 5, raised; 6, dropped; 7, raised; movement is thus from above down in order of wefts; left hand will keep wefts 3, 5, and 7 raised; next pair (8, 8′) will then enter plaiting, one on right (8′) forming sinistral which will be placed in new shed; sinistrals (2′-7′) on left project beyond left marginal dextral (1). *c,* formation of left edge: lowest free sinistral (2′) bent in with half-turn over sinistral above it (3′) and functions as dextral; next sinistral (3′) also turned over sinistral above it (4′); similarly, next sinistral (4′) will be turned over one above (5′); thus left edge formed by series of half-turns which converts free sinistrals into functioning dextrals.

4. The twisted two-strip commencement (*takawiri*, to twist). (See fig.25.) Two midrib strips from opposite sides are used, but before plaiting, each strip is prepared by twisting each leaflet forward under the strip attachment of the leaflet in front (tip end of leaf in direction in which leaflets are naturally inclined). The two strips so dealt with are placed together with the sinistral-bearing strip above as in the simple two-strip commencement. The leaflets cross naturally, and in the subsequent plaiting they are kept closed.

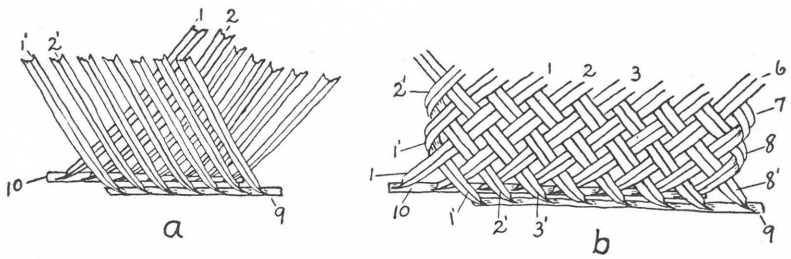


FIGURE 24. Simple two-strip commencement. *a*, midrib strip (9) from right side of leaf with leaflets naturally directed toward left placed above strip (10) from other side of leaf, with leaflets directed toward right; leaflets thus cross naturally to be interlaced with required stroke. *b*, left ends of midrib strips do not exactly coincide, upper strip a little to right in order that its first leaflet (1′) may pass under first leaflet (1) of under strip; leaflets of upper strip raised with right hand; left hand raises first leaflet (1) of lower strip, and first sinistral (1′) dropped under it; left hand drops first dextral (1), raises second dextral (2), and right hand drops next sinistral (2′); second dextral (2) dropped over sinistral (2′) and raises next dextral (3); process carried on to right in order thus begun; left hand picks up next dextral, right drops sinistral, left drops raised dextral over it and picks up next dextral; plaiting in check resembles technique of single split midrib commencement (fig. 23, *b*), and side edges formed by upward half-turns; thus on left, lowest sinistral (1′) turned in over sinistral (2′) above it; on right, lowest dextral (8) turned in below dextral (7) above to comply with check technique.

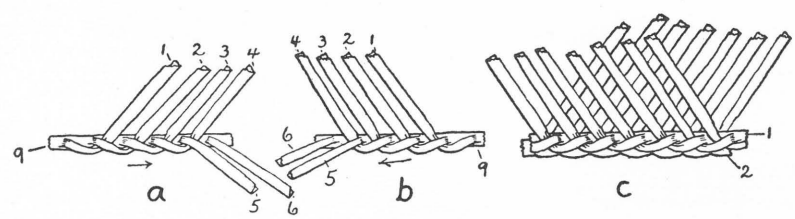


FIGURE 25. Twisted two-strip commencement. *a*, in dextral-bearing midrib strip (9), twisting commences at butt end so that leaflet 1 passes forward under strip attachment of leaflet 2 in front of it, and thus 2 under 3, 3 under 4, 4 under 5, and 5 will pass under 6. *b*, in sinistral-bearing strip, commencing from butt end on right, leaflets will successively pass under leaflets in front as shown numerically. *c*, sinistral-bearing strip (1) placed above dextral-bearing strip (2) and their leaflets cross naturally.

5. The simple two-pair commencement (fig. 26). The number of wefts is reinforced by the use of a pair of midrib strips with natural dextrals and another pair with natural sinistrals. No twist is used, and each pair is so placed that the leaflets of one strip alternate with those of the other. As a double quantity of wefts is thus provided, the edges of the leaflets may be trimmed and made narrower. In a fish platter, the open leaflet was used and both free edges of the leaflets split off with the thumb nail.

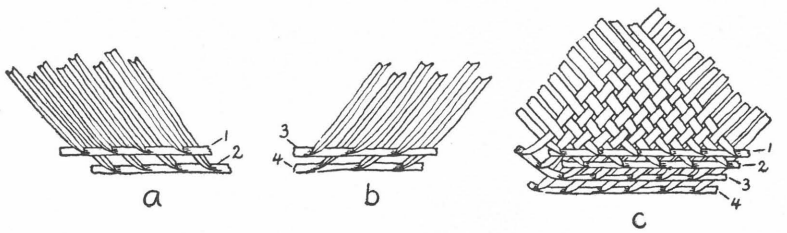


FIGURE 26. Simple two-pair commencement. *a*, two sinistral-bearing strips placed together so that leaflets of lower one (2) alternate and fill intervals between leaflets of upper strip (1). *b*, two dextral-bearing strips similarly placed, lower leaflets (4) alternate with those of upper strip (3). *c*, sinistral-bearing strips (1, 2) placed above dextral-bearing strips (3, 4); naturally crossed leaflets plaited in close check.

6. The twisted two-pair commencement used in Samoa (28, p. 185) and Aitutaki (27, p. 183) is not used in Rakahanga, but completes the series of commencement methods. In the twisted two-strip commencement, the twist is used with each single strip. In the twisted two-pair commencement, each pair is twisted by placing the two strips from the same side with their midrib strips together but the leaflets alternating. Commencing, the back leaflet of one strip is twisted forward under the two leaflets in front of it, one from each strip. The next leaflet from the other strip is then twisted forward under the two leaflets in front of it, one from each strip. The twisting goes on automatically by taking the nearest leaflet from each strip alternately and twisting it forward under the next two leaflets, one from each strip.

THE FINISHING EDGE

In mats, sheets, and platters the plaiting ends when sufficient depth has been secured. The commencing edge has been defined by the midrib strip in the various forms of commencement. The side edges have been formed by half-turns or direct bends. The far edge now ends in the free dextrals and sinistrals which project beyond the last horizontal row of check plaiting. The problem of disposing of the weft ends was met by plaiting them into a three-ply braid:

The three-ply braid finish (figs. 27, 28). The plaiting is turned so that the incomplete far edge lies longitudinally to the craftswoman. In Rakahanga, the plaited article is so placed that this far edge is on the right of the plaited portion. In this position, the dextral wefts are directed obliquely toward the plaiter, and the sinistral wefts are directed away from her. It is convenient to allude to the dextrals as near wefts and the sinistrals as far wefts. The side of the braid toward the plaiting (left) will be termed the inner side, and that on the other side (right), the outer. Thus, if the free

finishing edge were turned to the left, the terms inner and outer would apply equally well. The plies will also be termed inner and outer, according to the side from which they enter the braid. In plaiting a three-ply braid, the plaiting moves toward the plaiter, and there are two plies alternately on either side of the braid. To advance a step, the back ply crosses over the one in front of it to take up the middle position. The free weft ends are disposed of by adding them successively to a ply which has been brought into the middle position. The problem of the near and far wefts is settled by adding the near wefts to the inner plies and the far wefts to the outer plies.

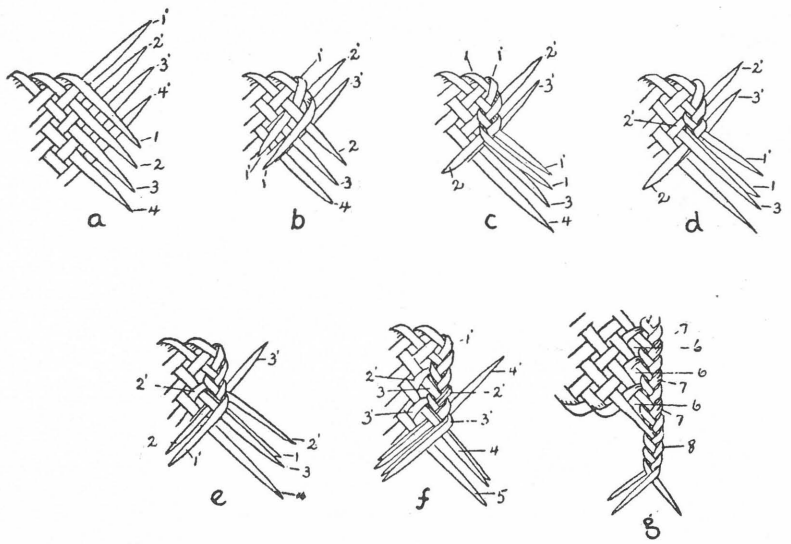


FIGURE 27. Spaced three-ply braid finish of mats, sheets, and platters. *a,* plaiting placed with finishing edge longitudinal and free weft ends to right; dextral wefts (1-4) near and sinistral wefts (1′-4′) far; braiding commences at far end and three plies will be formed by first far weft (1′) and first two near wefts (1, 2). *b,* first far weft (1′) bent over crossing weft (1) to form first ply; second ply formed by second near weft (2) which is lifted over first ply (1′); third ply formed by turning in first near weft (1) over second ply (2); the three plies now established; two plies on inner side with weft (1′) as back ply. *c,* inner back ply (1′) brought over ply (1) in front of it to middle position; this shifts the two plies to outer side so back outer ply (2) crosses over to middle position, again changing pair position; back inner ply (1) crosses over to middle position; this, however, is second turn of an inner ply and technique demands near weft added to every second turn of an inner ply. *d,* next near weft (3) therefore added to inner ply (1) by lifting it up from outer side of last weft (2′) that crosses it and laying it on inner ply (1) in middle position. *e,* back outer ply (1′) brought over last double ply (1, 3) to middle position but as it is second turn of an outer ply, next far weft (2′) must be added to it; far weft (2′) under braid is pulled down to level of outer ply (1′) on outer side and will be turned over to join it in middle position. *f,* technique established; near wefts (3, 4) have been added to alternate turns of inner plies and far wefts (2′, 3′) to alternate turns of outer plies. *g,* established technique has been followed throughout; near wefts enter inner side of braid with every second or alternate turn of inner plies and leave spaces (6) between them, shaded alternate outer plies (7) show where far wefts have entered; on reaching near end, plies continued on in free tail (8) and knotted.

Two varieties of technique have been developed. In one, the wefts are added to every turn of the plies. In the other, the wefts are added to alternate turns. These variations are influenced by the closeness of the wefts in the plaited article. Thus in the oven cover meant to retain the steam in the cooking oven, the plaiting is close and the wefts are added to every turn of the plies. In most of the other articles, the wefts are added to alternate plies. It is convenient, therefore, to allude to the two variations as the close three-ply braid and the spaced three-ply braid. Sometimes, owing to variations in the width of the wefts, both techniques (*whiri*) may be used in the one braid finish. The more common spaced three-ply braid is shown in figure 27. The close three-ply braid finish is shown in figure 28.

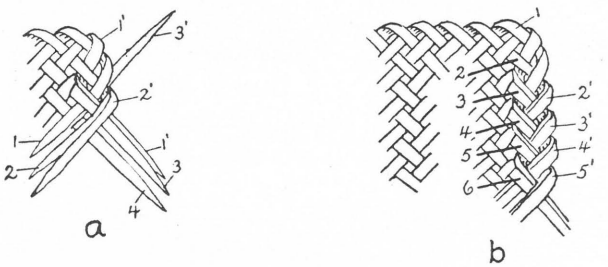


FIGURE 28. Close three-ply braid finish. *a*, commencement technique and figuring exactly the same as in figure 27; when ply 1′ is turned in from inner side, near weft (3) added to it; outer ply (2) has been turned to middle position and far weft (2′) added to it; in next turn, back inner ply (1) will be turned into middle position but instead of waiting for another turn, next near weft (4) will be added to it; similarly, when next back outer ply (1′, 3) turned into middle position, next far weft (3′) will be added to it. *b*, near wefts (2-6) enter with successive inner plies; far wefts (2′-5′) enter with successive outer plies, there being no spacing.

SHEETS, SCREENS AND MATS

From the coconut leaf, thatch sheets, screens, oven covers, and two kinds of mats are made:

1. Thatch sheet. Thatch sheets for cooking houses and temporary houses out in the plantations are made of split half leaves. The leaves are cut off in 6-foot or 7-foot lengths. Each section is split down the midrib and each half leaf plaited separately with the split midrib commencement in check with the open leaflet. In the left half leaf alternate leaflets are bent to the left to provide the crossing sinistrals, and the plaiting proceeds normally from left to right. (See fig. 23.) In the right half leaf the natural direction of the leaflets is sinistral, so the alternate leaflets are bent to the right to provide crossing dextrals. The plaiting proceeds from right to left, the right hand manipulating a working set of sinistrals at the working edge and the left hand placing a dextral in the shed formed. The side margins are turned in with the upward half-turn. (See fig. 23, *c*.) After plaiting a few inches in depth with one working section, the ends of the leaflets are left free. The narrow band of plaiting insures that the leaflets are crossed to form a better thatch. The technique is the same as in Cook Islands, Tahiti, and Samoa.

2. The sitting mat (*pora*) is made by continuing the thatch sheet technique to a greater depth and then finishing off the far edge with a spaced three-ply braid. (See fig. 27.) It resembles, moreover, the Aitutaki thatch sheet in the principle of joining two sheets together after commencing each separately. The split midrib commencement is used with the open leaflet in check, and the side margins are formed with an upward half-turn. The two separate sheets, after being plaited for a depth of about 1 foot, are placed one above the other. The wefts of the two sheets which coincide in position are then treated as double wefts and the plaiting in check is continued to reach the full depth, when the braid finish is used. The process of combining the two sheets by using double wefts is termed *kohiti,* a term also applied to check plaiting. (See pl. 2, *A.*)

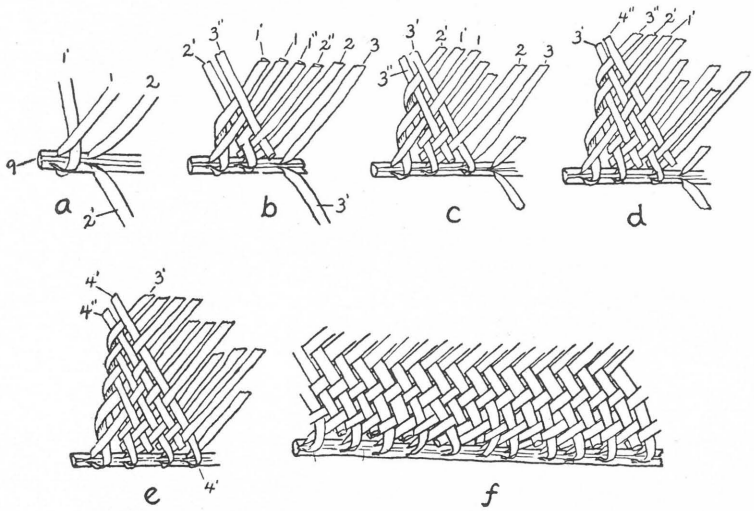


FIGURE 29. Commencement of screen (*pataro whani*). a, full midrib (*whani*) (9) with far leaflets (1, 2) and near leaflets (1′, 2′); far leaflets form natural dextrals; first near leaflet (1′) on left crossed over midrib and under its opposite leaflet (1) to form first sinistral weft. *b.* second near leaflet (2′) passed over midrib and also under first dextral (1) as technique is to be twill; two extra free leaflets (1″, 2″) introduced as dextrals to fill wide space between two natural dextrals (1, 2); extra leaflet (3″) also added as extra sinistral; first sinistral (1′) bent in to function as dextral and commence left edge of screen. *c,* third near leaflet (3′) has been crossed over midrib to act as sinistral and second sinistral (2′) has been turned in to define further the left edge. *d,* another free sinistral (4″) added; extra sinistral (3″) turned in to continue definition of left edge. *e,* fourth near leaflet (4′) has been added as sinistral and sinistral (3′) turned in to define further the left edge. *f,* development of twilled technique and use of additional wefts.

3. Wall screen (*pataro whani*). (See fig. 29.) The term *pataro* is identical with that used in Tongareva and distinguishes coconut leaf sheets or mats used as screens for the sides of houses, doorways, and also for sitting mats. The leaf midrib (*whani*) is not split, and its retention in the unsplit form gives the qualifying term, *whani,* to the screen. The same mat was also used as a seat, and was then termed a *pataro noho.* The whole midrib commencement, whereby the naturally directed leaflets of one side form the dextrals, is used. The leaflets from the other side are crossed over the midrib to engage the natural dextrals as sinistrals. The leaflets are kept closed (*piri*), and as

this method increases the spaces between the leaflets, extra leaflets torn off another section of leaf are introduced as both dextrals and sinistrals to close the spaces as the plaiting proceeds. A twilled-two stroke is used and a decorative effect is introduced by changing the direction of the rows of plaiting. Thus in the type mat in plate 2, *B*, the twilled-twos at the midrib commencement are in horizontal rows, which are changed to vertical rows and then to a horizontal row of twilled-four sinistrals, followed by a row of twilled-three dextrals and finally finished off in check. The change in the twill and in direction gives variety to the surface appearance of the mat and is introduced for the aesthetic effect. The side edge on the left is formed by upward half-turns and on the right by direct bends. The far edge is finished off with the spaced three-ply braid technique. (See fig. 27.)

4. The oven cover (*pataro umu*) carries the screen name, *pataro,* qualified by the word *umu* (oven) to denote its use as a cover placed over the food in the oven to keep in the heat during cooking. (See pl. 2, *C*.) The technique departs from that of the screen *pataro* and is exactly similar to that of the Tongarevan oven cover (*toto umu*). The cover is made of two leaflet-bearing strips in the twisted two-strip commencement (fig. 25). The closed leaflets are used with both check and twill, both side edges are formed by direct bends, and the far edge is finished off with the close three-ply braid technique. (See fig. 28.) In addition to being used to cover (*tapoki* or *puroku*) food while it is cooking, the closely plaited mat is used for other purposes. The *puraka* may be grated on it (*oro te puraka*) and also the mature coconut (*waru te hakari*), so that the mat receives the grated material. It is also used as a mat on which grated coconut is exposed to the sun (*tauraki ki te ra*) to make the oil run, and for drying fish and *Tridacna* (*tauraki te ika, te pahua*).

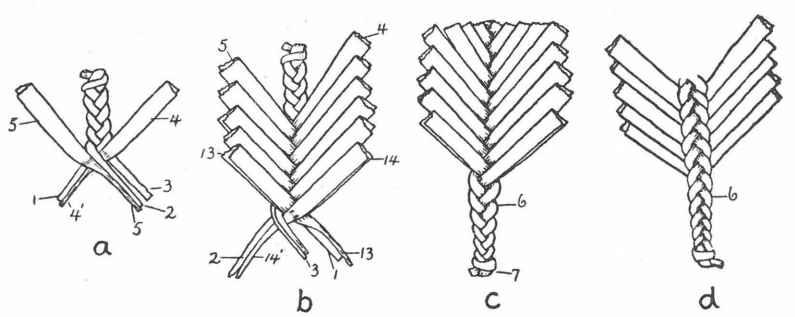


FIGURE 30. Keel commencement of *tapakau* mat. *a,* three strips of coconut or lauhala commence three-ply braid; when short length established, wefts added on either side after back ply is twisted over into middle position; thus when ply (1) twisted over into position from right, weft (4) from bundle on right is added to it, its midrib strip (4′) being placed proximally to lie on ply; back ply (2) then twisted over it from left, and weft (5) from left bundle added to it with its midrib strip lying on ply; all closed wefts added with their own midrib edges distal to worker. *b,* wefts added alternately on either side; thus weft 13 has been added from left to ply 1, weft 14 from right to ply 2, and ply 3 twisted into middle position to await addition of weft from left; in close addition of wefts, braid does not show on upper surface; fibrous midrib strips of wefts continue in braid for their entire length, and as earlier ones give out later additions continue plies. *c,* required length attained; braid plies continued on as free tail (6), finished off with overhand knot (7); in type mat, length of weft-bearing part of braid is 45 inches and both commencing and finishing free tails, 2.5 inches. *d,* under surface, braid stands out as contrasted with upper surface *c*.

5. The large sitting mat (*tapakau*) shows a marked departure from the technique ordinarily associated with coconut leaf material. (See fig. 30.) It is evident that whereas the midrib strips offer certain advantages in providing a natural commencement edge, their presence also imposes restrictions. The disadvantages of the wide spacing between the wefts has been met in making some articles by using the two-strip twisted commencement further reinforced by the addition of extra individual wefts to fill up interweft spaces. There are, however, further limitations as to the length of the midrib and the alternation in length and width of leaflets as they proceed toward the tip and the butt. Furthermore, the depth of the plaiting is limited to the length of the leaflets on one side of the midrib. To meet these disadvantages and provide a larger and neater mat, an artificial midrib is made, of any length required and with selected leaflets on either side set closely together, a distinct advance in technique. The new principle involved consists of plaiting a three-ply braid and adding selected leaflets on either side to each ply of the braid as it twists into the middle position. The appropriate *katuri* leaflets from toward the tip ends of the leaves are pulled off individually so that the butt ends of the leaflets carry short strips of the leaf midrib. In the closed leaflet wall screens and oven covers, the leaflet wefts average 0.8 inch in width, but in the *tapakau* mat the edges of the leaflets are split off with the thumb nail to form closed leaflet wefts from 0.4 inch to 0.5 inch wide. The leaflets from the opposite sides of the leaf are kept distinct, those from the right side being placed in a bundle (*ruruku*) on the left side of the craftswoman and those from the left side of the leaf on her right. When plaiting the braid commencement, the worker automatically adds the leaflets on her right to the right side of the braid and those on her left to the corresponding left side of the braid. The women are methodical in their work and, by attention to minor details beforehand, they not only quicken the work but avoid confusion and bad craftsmanship. The commencement is here termed, from its appearance, the keel commencement (fig. 30), to distinguish it from other braid commencements. Plaiting is commenced by laying the braided keel transversely in front of the plaiter. She sits on the near set of wefts and plaits the far wefts from left to right in twill. (See fig. 31.)

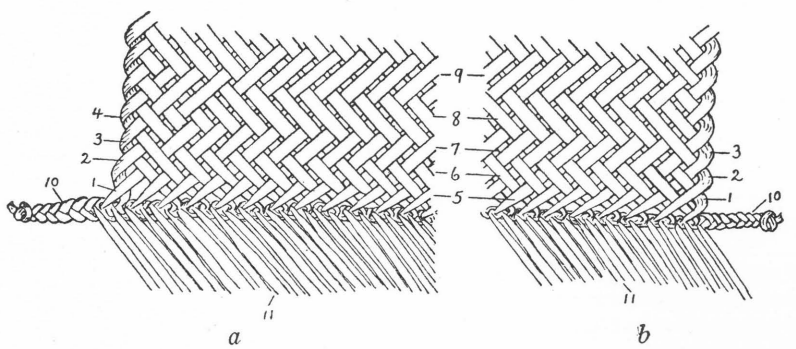


FIGURE 31. Twill plaiting of *tapakau* sitting mat. *a*, with finishing braid tail (10) to left and thick braid beneath, plaiter sits on near wefts (11) and plaits wefts on far side of braid, commencing on left; all wefts directed toward right from method of fixing them in keel braid; first weft (1) in position as natural dextral and next weft (2) turned under it toward left as sinistral; next two wefts in position as dextrals and next one (3) twisted under them to left to form sinistral and comply with twilled-two stroke used at commencement; sinistral (3) passes over first dextral (1) and comes to left edge; regular technique affected by necessity of turning left edge of mat; method of turning weft affected by nature of outer weft edge; thus midrib edge of closed leaflet weft being on right, open free edges are on left or outer side; in Rakahangan technique, such an outer edge is not considered suitable to direct bend as it

would open out and fray edges; upward half-turn adopted; in making this turn, weft naturally crosses over next weft; thus sinistral 3 having crossed over dextral 1, weft (2) below it turned in over it with upward half-turn to define left edge; similarly, weft 3 turned over weft 4 above and so successively as sinistrals reach left edge; from weft 3, every alternate weft turned to left to form sinistral and passes under two dextrals to make horizontal row of dextral twilled-twos (5); sinistrals passed under two dextrals, lifted, and passed over two dextrals to form horizontal row of sinistral twilled-twos (6); exception to rule is sinistral 4, which, being near edge, has been left over three dextrals instead of two; such irregularities take place near edge, for not only must turned weft defining left edge be turned over sinistral above it, but it must pass under next sinistral to form better edge; above row of sinistral twilled-twos (6) dextrals emerge to form horizontal row of twilled-twos (7), succeeded by horizontal row of sinistral twilled-threes (8), then dextral twilled-threes (9). *b*, plaiting proceeds to right edge defined first by last dextral (1) turned in under dextral weft (2) above it; technique of turning in wefts on right edge again influenced by nature of outer weft edge formed here by leaflet midrib; wefts therefore turned in with direct bend without any half-turn, as leaflet midrib forms good outer edge, direct bends having been commenced by turning bent-in weft under crossing dextral above it; this course followed throughout; thus weft 2 passes under weft 3 above it and successively along right edge; stroke technique established on left carried out along full course of working section, but when plaiting reaches right edge, departures from regular stroke fit in with formation of right edge; continuation of horizontal rows of twill from left, commencing braid tail (10), and unplaited near wefts (11) shown; depth of plaiting from braid keel to last horizontal row of dextral twilled-threes (9), 4.5 inches.

From the last horizontal row of twilled-threes in figure 31, the stroke technique is changed to vertical rows of twilled-twos for a depth of 12 inches. The stroke then changes to 5 horizontal rows of twilled-twos followed by about 10 rows of check. The dextral wefts in the check portion are narrowed by folding them over slightly at one edge. The depth of plaiting to the last check row is 22.5 inches. The far edge of the plaiting is then finished off with the spaced three-ply braid as in the preceding mats. (See fig. 27.) The free tail end of the braid is knotted and pushed back through the plaiting below the braid edge with the knot to the under surface. This completes one half of the mat. The unplaited side is then turned so that the worker sits on the plaited part. The second half is plaited in exactly the same manner as the first. (See pl. 3, *A*.) The *tapakau* is the best mat I have seen in coconut leaflet material. The long leaflets of the Rakahangan palms render the depth possible. Though the plaiting depth is 22.5 inches, the diagonal course of a single leaflet weft is 32 inches and at least an extra 2 inches are included in the braid.

COOKING RECEPTACLES

A group of plaited articles known generically as *raurau* divides into two classes, cooking receptacles and serving platters. With the exception of one used for cooking fish, the cooking receptacles have been created by the need for containers in which to cook the grated *puraka* preparations. In Tongareva, where until recently the *puraka* was not present, the technique of the *raurau* cooking receptacles was not known. The *raurau* food platter upon which the cooked food is served to guests follows the technique of the cooking *raurau,* but the finishing edge is made neater by finishing it off with a three-ply braid. Three forms of cooking *raurau* and three forms of platters are made:

1. The fish receptacle (*raurau to ika*) is the roughest form of *raurau*. (See pl. 3, *C*.) Two midrib strips from opposite sides of the leaf, each carrying 10 or 11 leaflets, are plaited together in check, the sinistral-bearing strip above the other. A leaflet at either end of the sinistral strip is left free for tying leaflets. The receptacle is about 12 to 13 inches wide. The side edges are turned in, and the plaiting proceeds until it is about 12 inches deep. The free ends of the dextrals are drawn together and tied in an overhand knot close to the plaiting, and the sinistrals are dealt with similarly. The fish are placed in the receptacle, which is hollow on the back surface of the leaflets, and the leaflet ends are simply tucked in around the fish. The plaiting is folded over the fish, the free tying leaflets are passed around parallel with the midrib strip, and the ends tied with a reef knot. The receptacle then serves as a cooking dish which is placed in the earth oven for cooking.

2. The large *puraka* receptacle (*raurau papa*) is also made of two opposite strips bearing 11 or 12 leaflets. (See pl. 3, *B*.) The sinistral-bearing strip is placed above the other, with the shiny surface of the leaflets upward. All the wefts are plaited in check with open leaflets. After the plaiting has reached a depth of about 5 inches, a leaflet is dropped out at either side edge for tying. The plaiting continues for a full depth of about 22 inches, the side edges being defined by turning in the wefts with a half-turn. The far finishing edge is fixed by tying the crossing wefts together with a reef knot in pairs, a sinistral and a dextral being included in each knot. For use, the *raurau* is turned over with the dull surface upward, as this surface is slightly hollow. The grated food (*puraka oro*) is laid on the midrib strip half of the sheet, the other end is folded over, and the two side leaflets that were left out of the plaiting are brought over to tie the receptacle together. The food in the receptacle is then placed in the earth oven for cooking.

3. The smaller cooking receptacle (*raurau kapukapu*) is made in a similar manner but with shorter midrib strips carrying about 7 leaflets. (See pl. 3, *D*.) The plaiting in check with open leaflets proceeds for a depth of 14 inches. The two leaflets which cross in the middle of the finishing edge are knotted together with a reef knot, which braces the plaiting edge together and prevents it from unraveling. The food cooked in the *raurau kapukapu* consists also of grated *puraka* when not so much quantity is required, and also of the preparation (*pupu*) of grated *puraka* mixed with coconut. The dull surface is again the hollow part, so the receptacle is turned with that surface uppermost. The food is placed on the midrib half and the other end doubled over. The free weft ends, which have been left long and brought around from either side, are passed around the sides above the projecting ends of the midrib strip, and tied at the back with a reef knot. The receptacle is neat and effective.

4. The ordinary platter is made of two opposite midrib strips, each carrying 8 leaflets. (See pl. 4, *A*, *1*.) With the shiny surface of the leaflets up, the sinistral-bearing strip is laid above the other. The stroke is a check with open leaflets, and the side edges are turned in with half-turns. The platter is about 12 inches wide at the midrib strip commencement. The plaiting continues for a depth of about 13 inches. The free ends of both sets of leaflets are then plaited in a single course three-ply braid, commencing on the left with the shiny surface upward. As in screens, the dextral wefts go straight into the braid from the plaiting edge, but the sinistrals pass under the braid and enter the braid in the outer plies. On reaching the right edge, the wefts are continued as a free braid tail for about 4 inches and tied in an overhand knot. The tail is then doubled in on the dull surface side, pushed through under a couple of wefts, and the knotted end is brought back again. The platter is hollow on the dull surface, which is turned uppermost in use.

5. A platter for serving fish (*raurau rava ika*) is more elaborate in that two sinistral-bearing and two dextral-bearing strips are used to supply a double quantity of wefts. (See fig. 32; pl. 4, *A, 2*). Owing to the extra material, the edges of the leaflets are split off to form narrower and neater wefts. The two-pair simple commencement shown in figure 26 is used. The side edges are turned in with half-turns, and the check stroke with open leaflets is used. Each midrib strip carries 7 leaflets, thus making 14 wefts in each series. The platter is a little more than 12 inches wide at the strip commencement. The plaiting continues for a depth of 15 inches where the plaiting narrows down to 9 inches in width. The finishing edge is completed by a two-course three-ply braid, shown in figure 32.

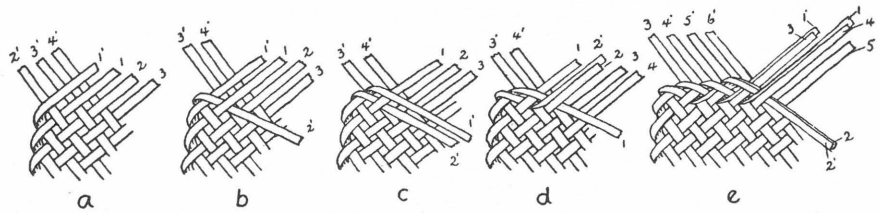


FIGURE 32.—Fish platter, first course of two-course braid finish. *a,* left corner of finishing edge; sinistral weft (1′) has been bent at right angles over next sinistral (2′) to form first ply of three-ply braid. *b,* sinistral (2′) doubled over crossing ply (1′) to form second ply, and first dextral weft (1) lifted over second ply to form middle ply and so establish commencement of three-ply braid. *c,* back ply is outer ply (1′), crossed over middle ply (1) to take middle position. *d,* back ply is now inner ply (2′), crossed over middle ply (1′), and next dextral weft (2) added to it; technique now established; back ply comes alternately from outer and inner sides to take middle position by crossing over last ply placed in middle position; every time inner ply placed in middle position, next dextral weft automatically added to it. *e,* continuation of braidiing shows successive addition of dextrals (1-4) to inner plies; outer plies receive no additions as sinistrals and except for first (1′, 2′) are left out for second course; dextral wefts inclined in course of braiding; sinistrals directed in opposite direction; braiding continued to right end of finishing edge and thus uses up all dextral elements; plaiting then turned over and braid bent around in the opposite direction on reversed surface of plaiting; free sinistrals now run in same direction as plies of braid; braid thus simply continued in second course which uses up remaining sinistral wefts; when all sinistrals braided, free tail continued for short distance and fixed with overhand knot, excess of material being cut off; finishing edge thus consists of distinct braid on each surface.

6. A small, neat platter (*raurau mereki: mereki,* modern term for plate) was made of two opposite midrib strips each carrying 6 leaflets. (See pl. 4, *A, 3*). In the type specimen examined, the dextral strip was placed above the other. The check stroke was used with the open leaflets and the side edges were turned in with half-turns. The platter at the commencement edge is 8 inches wide. The plaiting is continued for a depth of 8 inches. The 6 sinistral wefts are then braided in three-ply from the middle line toward the left. After all the six wefts have been included in the braid, the ends are continued as a free braid tail for a length of about 11 inches. The 6 dextral wefts are similarly treated on the right. The two tails are then brought back along their respective sides to the midrib strip, where they are passed through from the dull, concave side of the platter to the inner side of the marginal wefts. The two ends are drawn taut along the outer side of the strip margin and tied together in the middle line with a reef knot. This type of platter is probably modern but illustrates a form of technique seen in the *pite* group of plaited articles.

The *raurau* are characterized by the natural concavity formed on the dull side of the leaflets when plaited together or by folding. They are really plaited as sheets of material. The *pite* group consists of two types which commence with the *raurau* technique but are definitely converted into shaped receptacles by the introduction of corners or points into the plaiting. In both, the two-strip simple commencement is used, and the check stroke with open leaflets. Both utilize the *raurau mereki* method of disposing of the leaflets at the finishing edge by braiding the dextrals and sinistrals separately

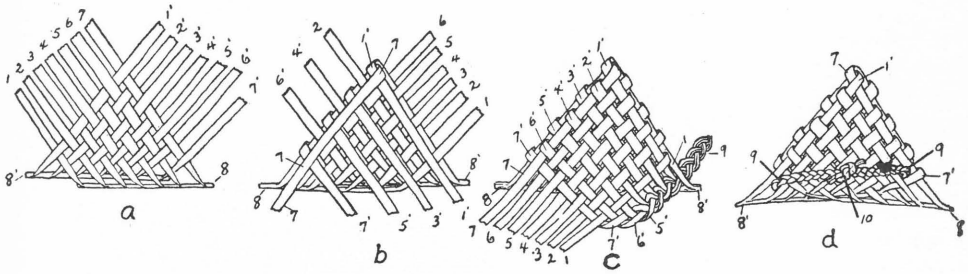


FIGURE 33. Pointed *pite* receptacle. *a*, sinistral-bearing strip (8) laid over dextral-bearing strip (8′) with shiny surface of leaflets up; ends do not coincide but project at either end so as to allow for diagonal interlacing of leaflets; left dextral (1′) lifted and left sinistral (1) dropped under it; check stroke continued until seven wefts from both strips interlaced in check to form triangular piece of plaiting with apex upward; projecting free leaflets have now to be doubled back and plaited again in check to form double layer of plaiting. *b*, plaiting is turned over; plaiting commences on left margin by doubling over wefts 1′, 3′, 5′, and 7′, which have passed under left marginal weft (7); alternate wefts (2′, 4′ and 6′) above marginal crossing weft (7), left down; doubling over of set of alternating wefts forms shed in which crossing weft (7) laid by doubling it back over right marginal weft (1′), thus forming point of *pite* at apex of plaiting; seven wefts on left have now been divided into two alternating sets which will continue check stroke; in next movement three projecting wefts (2′, 4′, 6′) will be doubled over weft 7 in shed and four recumbent wefts (1′, 3′, 5′, 7′) raised, thus forming shed into which next crossing weft (6) will be placed by doubling it back over its previous course. *c*, second layer of plaiting completed by manipulation of two alternating sets of wefts on left until all wefts which projected on right margin included; in figure, completed plaiting projects below base of midrib strip, but in actual plaiting, leaflets drawn close together and do not project so far; set of wefts (7′-1′) on right now plaited in three-ply braid; thus left weft (7′) twisted over next weft (6′); third weft (5′) passes over first (7′) and second (6′) twisted over it to middle position; three-plies established and other wefts successively included by being added to ply which comes in from left; when all included, braid passed through under first part of right marginal weft (1′) and continued on as free tail (9); wefts 1-7 on left dealt with similarly and free tail passed through under first part of left marginal weft (7); opening of *pite* thus defined by midrib strip on one side and three-ply braid on other. *d*, plaiting turned over and two braid tails (9) brought together in middle line where tied in reef knot (10); leaflet strips about 7 inches long; *pite* when opened out, about 5 inches in diameter across rim and 6 inches deep.

and fastening the free braid tails through at the back of the midrib commencement edge.

The two forms of *pite* consist of a pointed conical article and a four-cornered one:

1. The pointed *pite* (*pite pahua*) is used by women when gathering *Tridacna* (*pahua*) for food. (See fig. 33; pl. 4, *A*, 5.) The receptacle is hung with the open mouth upward on a stick in the sand. After shellfish have been collected, the shells are opened and the flesh put in the *pite*. This saves carrying the heavy shells back to the cooking houses.

2. The four-cornered *pite* (*pite pupu*) is used for cooking the preparation (*pupu*) of grated *puraka* and coconut. (See fig. 34; pl. 4, *A*, 4). The receptacle has four corners (*e ha take*). The technique of the corner is simple and is similar to that used in satchels in New Zealand. In any plaiting surface, if the normal lean of a weft is turned in the opposite direction and the crossing weft is similarly dealt with, a corner will result.

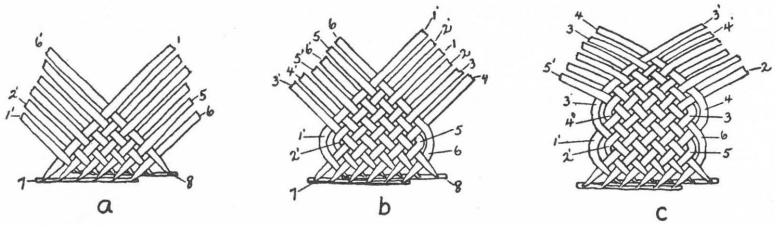


FIGURE 34. Four-cornered receptacle (*pite pupu*), technique of corners. *a*, simple two-strip commencement with dextral-bearing strip (7) placed over sinistral strip (8); each strip carries six leaflets kept spread open and interlaced in check. *b*, if lowest weft (1′) on left bent in, ordinary edge will result; to form corner next weft (2′) turned in at right angles and plaited in check with crossing sinistrals; lowest weft (1′) bent in parallel with 2′ to act as dextral and cross sinistrals in check; figure shown spread out on the flat, but in actual plaiting both turned-in wefts drawn taut to form definite corner where weft 2′ crosses weft 3′; weft 3′ and those above it (4′-6′) also forced to change direction and come down closer toward midrib strip; on right, similar plan pursued to form corresponding corner; second lowest dextral (5) turned in to function as sinistral and its crossing with dextral 4 forms point of second corner; lowest dextral (6) turned in and drawn taut to deepen corner; with all wefts crossing in check, second pair of corners may be formed in exactly same manner as first; thus lowest free weft on left is 3′ and corner key weft above it is 4′; similarly on right, lowest free weft is 4 and key weft above it is 3. *c*, on left, key weft (4′) turned in as dextral and forms corner with crossing weft 5′; weft (3′) below it follows suit and deepens third corner; both wefts (4′, 3′) cross sinistrals in check; on right, key weft (3) turned to act as sinistral and form fourth corner with crossing weft (2); weft 4 below it follows suit; with all wefts drawn taut, four corners distinctly defined and margin formed by far edge of plaiting curved around to more nearly approach midrib edge; four-cornered hollow receptacle formed; six free weft ends on either side plaited as free braid tails and brought around behind midrib edge in exactly same technique as in figure 33, *c*, *d*.

BASKETS

The term basket (*kete*) is here used to include deeper and more permanent receptacles than the *raurau* and *pite* articles just described, and it includes articles usually described as satchels. Four types are made from coconut leaflets and two from lauhala. Of the four coconut leaf types, a round basket and a satchel clothes basket are local. The third type (*tongini*) was introduced during the post-missionary period, and the rough braided basket was also probably introduced.

1. The round basket (*kete*). The round basket is the common receptacle for food and other objects, the common baskets of other areas made with open leaflets in check not having been adopted. (See figs. 35, 36; pl. 4, *B, 2-3.*) The basket is made of two midrib strips from opposite sides of the leaf. The two strips are dealt with by the twisted two-strip commencement (*takaviri*) and a twilled-two plait is used after the *whatu* technique and join (fig. 35) are established. The horizontal row of dextral checks which completed the *whatu* is followed by a horizontal row of sinistral twilled-twos, another row of dextral checks, and then alternating rows of sinistral and dextral twilled-twos of two each. This forms a plaited cylinder about 6 inches deep.

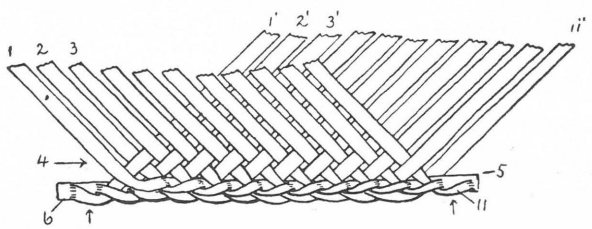


FIGURE 35. The *whatu* technique, round basket, twisted two-strip commencement: most twisted strips, about 50 inches long; sinistral-bearing strip (5) placed above dextral-bearing strip (6); *whatu* technique consists of joining strip together with check stroke; to establish this, right hand holds up number of sinistrals on left and left hand holds up some dextrals; second sinistral (2) dropped and first dextral (1') dropped over it; right hand drops third sinistral (3) and left hand drops second dextral (2') over it; from this commencement, each hand alternately drops next weft on right; horizontal row of dextral checks (4) produced; this continued to end of strip; two ends of double strip brought together and joined; if any interweft space too wide, extra single weft (*huru*) interpolated and its butt end rests between the two midrib strips; in preparing midrib strips, each weft twisted forward in front of *huru* and so successively fixed; end leaflet remains free, having no leaflet in front of it under which it may be twisted; similarly, first leaflet to be twisted forward has no leaflet passing under it; thus on sinistral strip, end leaflet (1) on left free; first twisted leaflet (11) on right has no leaflet passing under its loop between it and midrib strip (5); when the two ends brought together, free leaflet (1) passed up under loop of leaflet 11 in place indicated by arrow; in this way, twisting of strip completed by joining it into circle; in lower dextral strip (6), free leaflet (11') on right, and free loop formed by first dextral (1') on left; with ends together, free leaflet (11') threaded up through loop of dextral 1' in place indicated by arrow; this completes join and crossing leaflets plaited in check to complete *whatu* join.

The bottom of the basket is formed by decreasing the diameter with each circle of weft strokes. Thus from the last circle of twilled-twos with single wefts, the next circle of twilled-twos is formed by drawing two adjacent wefts together to form a double weft with both dextrals and sinistrals. This rounds the bottom and narrows (*potiki*) the circle of plaiting. After this round, the narrowing is repeated (*ka potiki whakohou*) by bringing two double wefts together to form compound wefts containing four leaflets in each weft. The four-element wefts are now plaited in check for three rounds. The three rounds of check plaiting form a raised cuff. The cuff is then flattened longitudinally, taking the join (*tutaki*) on the rim as the far end. From the far end of the unclosed slit bottom, the plaiter commences a three-ply braid (*whiri*) with the wefts directed toward her on either side. When she gets to the near end and has incorporated all the wefts directed toward her in the braid, she continues the braid in a free, thick, braided tail (*take*) and fixes the end with an overhand knot. The free tail is about 11 inches long. The ends are then reversed, and the remaining wefts on either side, which are now directed toward the plaiter, are braided in a similar way. The bottom is thus closed by a two-course braid, each course being completed by its own free tail. (See fig. 36.) Each tail is pushed through over two crossing wefts into the inside of the basket. The cuff is stretched and flattened out and the free tails pushed through to the outside at the ends of the bottom. The tails are turned upward and after a short course of 3.5 inches on the outside the knotted ends are pushed through to the inside. (See pl. 4, *B, 2-3*.) Owing to the longitudinal course of the thick braid tails on the bottom, the basket described is more elliptical than circular at the bottom. In the type basket, the wefts were 0.8 inch wide, but in a smaller, neater basket the wefts were 0.4 inch wide. In the neater basket, the narrower wefts were rendered possible by introducing a larger number of the extra wefts (*huru*).

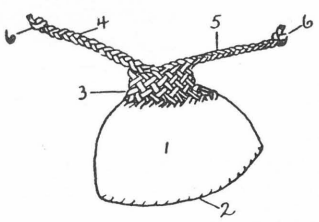


FIGURE 36. Round basket, bottom closure: rounded body (1) of basket with midrib strip rim (2) shown with cuff-like bottom (3) formed of three rows of check with four-element wefts; bottom closed by bringing sides together; first braid (4) formed by plaiting from right to left with wefts directed toward left; remaining wefts directed toward right, plaited from left to right to form second braid (5); both braid tails finished off with overhand knots (6).

2. Clothes basket (*kete ngahengahe*). The basket is made in the form of a satchel. (See figs. 37-39; pl. 5, *A*, 1.) It shows a marked advance in technical detail. The basket is distinguished by the braided rim commencement, the use of changing twill, and the advanced type of braid finish at the bottom. In addition, the rim is wrapped with colored lauhala and the satchel decorated with wrapped strips of aërial hala roots, tufts of colored fiber, and pearl shell ornaments. The leaflets of young coconut leaves are split with the thumb nail (*tete*) and passed over the fire (*parara*) to soften them. They are then dried in the sun (*haumaki ki te ra*). The leaflets are split from the leaflet midrib, and any thick strips from the vicinity of the midrib are carefully removed so that the strips are of even thickness. A number of individual wefts are thus prepared, which are cut off square toward the butt ends and average about 0.2 inch in width. The commencement at the rim is a unique feature,

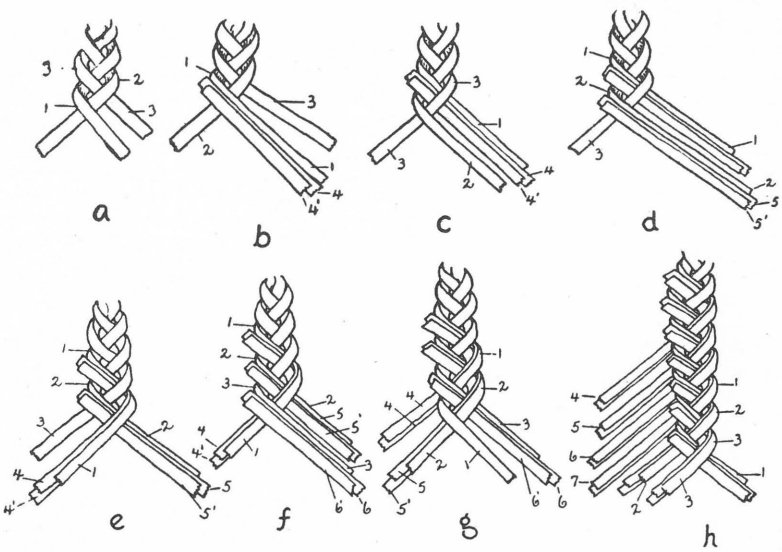


FIGURE 37. Braid commencement of rim of *kete ngahengahe*. *a*, three strips of leaflet (1-3) commence three-ply braid; back ply (1) on left crossed over into middle position. *b*, two wefts (4, 4′) added together to middle ply (1) which came in from left; cut-off butt ends rest on turn of ply and long length of wefts joins long length of ply; care taken in adding wefts to keep shiny surface of wefts uppermost; though leaflet midribs with thicker parts on either side split off, edge of weft toward midrib still shows different consistency to edge away from it; to obtain neat plaiting, midrib edges of each series of wefts must all face same direction; of two wefts added to braid, under one will subsequently function as dextral and upper as sinistral in all pairs added to braid; in adding pairs to braid, craftswoman selects wefts with midrib edge to right for lower element (4) and wefts with midrib edge to left for upper element (4′); detail indicates care taken to enhance effect. *c*, two wefts (4, 4′) being in position, back ply (3) on the right crossed over them to middle position; back ply on left (2) crossed over 3 to take middle position. *d*, all additional pairs of wefts added to ply which comes in from left as in *b*; two wefts (5, 5′) therefore added to middle ply from left (2). *e*, two plies being now on right, back ply (1) with its two added wefts (4, 4′) brought over to middle with half-twist to round braid; position of wefts now reversed, weft 4 being above 4′ and ply 1 above 4. *f*, back ply (3) brought over from left to middle position and two wefts (6, 6′) added to it. *g*, back ply (2) on right brought over to middle position bringing two wefts (5, 5′) with it; back ply (1) on left brought over to middle position, but two wefts (4, 4′) associated with it, now sufficiently fixed by their course in braid, left out as shown; fixation technique established; two more wefts will be added to middle from left (1), and back ply on right (3) will be brought over to middle position with its accompanying wefts (6, 6′); back ply (2) will then be brought over to middle position from left, leaving two wefts (5′, 5) fixed on left; two new wefts will be added to middle ply (2) to take place of those left out; technique continued until required length reached; thus each ply contains original ply element with two added wefts; in every movement from left, two fixed wefts left out, original ply element brought over to middle position, and two new wefts added to it. *h*, section of braid with paired weft added.

for in the preparation of individual separate wefts the ordinary basket commencement by utilizing a midrib strip carrying the leaflets has been abandoned. The individual wefts are therefore connected by means of a three-ply braid as shown in figure 37. The three-ply braid is continued for twice the length of the basket. The material is then turned over with the braid toward the worker, and the shiny surface of the wefts, which were reversed by the half-twists in the braid, is again uppermost. This surface will form the outer side of the satchel, and the thick part of the braid will also be reversed to the inside of the rim. The paired wefts are now all directed toward the right. The upper elements of the pairs function as naturally directed dextrals, and the lower elements are turned to the left to function as sinistrals. Plaiting commences with a horizontal twilled-two. (See fig. 38.) The body of the basket, after the rim

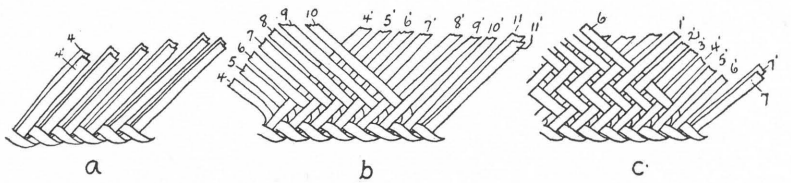


FIGURE 38. Twilled plaiting of *kete ngahengahe*. *a*, braided rim commencement turned over in position for plaiting with all wefts directed toward right; upper elements (4′) form dextrals and lower elements (4) will supply sinistrals. *b*, technical twilled-two stroke; commencing on left, number of upper laying elements raised with right hand; lower element on left (4) turned to left with left hand, and next lower element to right (5) also turned to left; left upper weft (4′) dropped over the required two, and left down; next lower element (6) turned to left and next upper element (5′) dropped over it from right hand and left down; similarly, upper weft (6′) dropped over lower weft (7) and so plaiting moves to right by successively turning lower weft to left and dropping upper weft over it; once commencement made, twilled-two proceeds automatically. *c*, when a sufficient depth has been secured, two pairs of dextrals raised with intervening pair left down; thus in last movement, two pairs (1′, 2′, 5′, 6′) were kept raised and intervening pair (3′, 4′) left down; sinistral weft (6) was then bent into shed prepared; in next movement in order to continue horizontal row of twill, upper or far numbers of raised pairs (1′, 5′) will be dropped and recumbent wefts below or on near side of raised wefts (3′, 7′) raised to complete raised pairs; the next sinistral (7) will be bent into shed and twilled-two technique thus continued; result as shown on surface is two horizontal rows of twilled-two dextrals and one intervening row of twilled-two sinistrals; horizontal twilled-twos continued for full length of braid; ends of braid then brought together and free wefts from each end plaited in same twill so as to close space (*tutaki*).

fixation by 3 horizontal rows of twilled-twos, was changed in the type basket to vertical rows of twill for about 2.4 inches in depth. The plait was then changed to 3 rows of horizontal twill for another 2.4 inches. This was succeeded by 3 horizontal rows of check, preparatory to closing the bottom of the satchel. The bottom was closed by a two-course braid finish (*hiri teru*) in which the end of the first course was turned over to form the commencement of the second. The second course was finished off with a knot close to the plaiting and not pushed through to the inside. During the second course, the wefts, after a few turns in the braid, were successively dropped out on either side and then cut off close to the braid turns. This made a neater finish than the ordinary two-course braid in which the wefts are kept in the braid for their full length. The technique has been described for the baskets of Aitutaki (27, p. 186).

The rim (*kaungutu*) was finished off and embellished by a strip of the thin *papa* material obtained by splitting off the upper surface of the lauhala. It was dyed red and attached as shown in figure 39. Ornamentation was provided by the use of splints, fringes, and pearl shell. Ornamental splints (*weri*) were made of strips of aërial hala rootlets about 0.3 inch wide and 0.05 inch thick. These were wrapped spirally with a strip of dyed *papa* material. One strip passed along under the bottom, was bent up sharply at each bottom corner, and ascended at the ends to meet the rim where the ends were cut off level. A thin strip of material passed through the basket and around the splint fastened them at the rim and at each lower corner. A horizontal splint was then passed around the basket about halfway down. The ends overlapped and were tied together. They were also tied to the vertical limbs of the first splint at the ends. Two other vertical splints were passed from rim to rim under the bottom, dividing each side into three approximately equal parts. Short fringes of bast fiber, dyed red, were attached at the rim to the upper ends of the vertical splints and to the crossings with the horizontal middle splint. Pearl shell pendants (*tau parau*) triangular in shape but with the short base curved were attached to the fringes in sets of three by threads passing through two holes bored in each pendant. The pendants average 0.6 inch by 0.4 inch. The satchels are neat and attractive. The one figured (pl. 5, *A*, 1) is small and was made as a sample by Tina, the only woman on Rakahanga who knew how to make them. The baskets were made much longer and were used to contain garments (*ngahengahe*), hence the name, *kete ngahengahe*. Traditional history states that a woman named Utua-vaine once avoided the regular migration from Te Kainga to Manihiki by slipping away from the canoes to get her *kete ngahengahe*. This was adduced as proof of the age of the basket technique. The wrapping with dyed lauhala and the colored fringes are probably of more recent origin.

FIGURE 39. Rim wrapping of *kete ngahengahe*: strip of *papa* material (1) 0.8 inch wide folded longitudinally over rim to conceal rim braid (2) on both sides; length of thin two-ply twisted sennit cord (3) knotted at one end, passed through hole made through rim just above two lower edges of *papa* strip, knot to inside; a series of half-hitches made through similar holes about 0.3 inch apart, crossing (4) of half-hitches being on outer side of rim; wrapping worked to left to complete circuit of rim.

4. Foreign basket (*tongini*). This type of basket has been described by Handy (15, pp. 21-35) for Tahiti, and for Cook Islands by Hiroa (27, p. 168), and the Rakahangan technique differs in no way from that described. In Rakahanga the basket is made with four interlocking pairs of midrib strips, each pair carrying 4 and 3 leaflets respectively. (See pl. 4, *B*, 1.) The handles are plaited in flat bands, and the leaflets that pass around on the outside are plaited in three-ply braid and knotted together under the basket bottom. The baskets are large for such baskets. The basket is frankly acknowledged not to be native to Rakahanga. In Tahiti it is called *oini* and in Aitutake, *ohini*. The Rakahangan name, *tongini*, is evidently a local adaptation of the other name.

5. Full-leaf braided basket (fig. 40). This quickly made receptacle is made from a section of coconut leaf midrib with the leaflets on either side intact. It has been described by Handy (15, p. 62, fig. 27) for Tahiti. I could not determine whether it was introduced into Rakahanga from that area with the *tongini*, but the identity of technique favors the probability of diffusion in the post-missionary period.

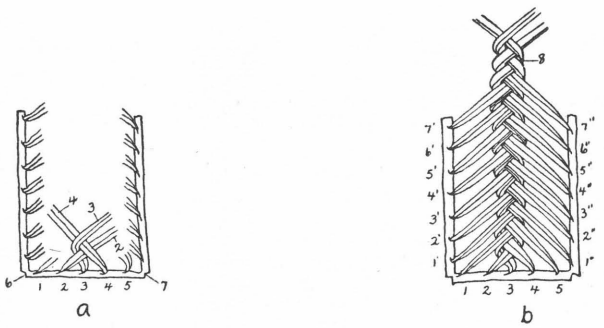


FIGURE 40. Braid technique of full-leaf braided basket. *a*, section in middle defined by counting off about five opposite pairs of leaflets and cutting nicks (6, 7) on under surface of midrib to outer side of end leaflets (1, 5); the two ends bent up at right angles to middle section; seven opposite pairs of leaflets counted on either vertical limb and ends cut off; horizontal middle section forms bottom of basket; commencing with leaflets on one side of midrib, three-ply braid started at bottom; middle leaflet (3) forms first ply, left leaflet (2) brought over it to form second ply, and leaflet on right (4) brought over to middle position to form the third ply; the back ply (3) brought over to the middle position from left ready to have weft from left added to it. *b*, from last position, leaflet 1 added to middle ply; back ply on right (2) crossed to middle position from right and next leaflet on right (5) added to it; this includes last leaflet from bottom section; from now on, with each turn of braid, leaflet added alternately from either side commencing with lowest leaflet (1′) on left and then lowest leaflet (1″) on right; when all side leaflets have been added to braid, ends continued on as free braid tail (8) and knotted. Basket turned over and leaflets on other side braided in similar manner; the two braid tails knotted together to form handle for basket.

EYE SHADES

Plaited shades for the eyes (*taumata*) are very quickly and roughly made, as they are not permanent articles but are discarded after use. Two forms were seen. The simplest form was made from one midrib strip carrying 7 leaflets. (See fig. 41.) The other is made with the simple two-strip commencement, each strip carrying four leaflets. The check stroke with the open leaflets is used. The technique is similar to that of the first shade in commencement, but the plaited band is made longer. Thus in the simple eye shade only two half-turns are made on the short side of the shade (fig. 41, *b*), but in the second form six half-turns are made. The end edge (fig. 41, *c*) is formed in the same way, but instead of finishing with a three-ply braid, a narrow band is plaited by closing the leaflets and thus narrowing the wefts. The ends of the leaflets are knotted and form one tie, and the other tie is provided by a long continuation of the midrib strip. (See pl. 4, *A*, 6.) These shades were used in fishing to protect the eyes from the glare of the sun, but plaited hats with brims are taking their place.

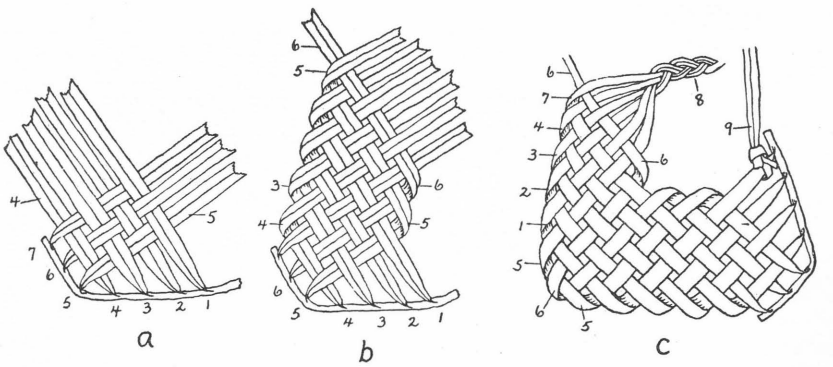


FIGURE 41. Simple eye shade (*taumata*). *a*, midrib strip split off from right side of leaf and section bearing seven leaflets cut off; four leaflets (1-4) on right function as natural sinistrals; strip bent up on left and three leaflets (5-7) bent in as dextrals; the four sinistrals and three dextrals interlaced in check with open leaflet. *b*, plaiting proceeds by turning lowest sinistral (4) on left with upward half-turn to cross sinistral 3 above it in check; left edge formed in same way by successive half-turns; on right, edge formed by turning lowest dextral (5) with upward half-turn to cross dextral (6) above it and function as sinistral; next dextral (6) turned and plaiting continued until other six wefts have crossed sinistral (6) which is key weft for change in position. *c*, plaiting moved so that what was left edge is toward plaiter; key weft (6) is bent upward over crossing weft (5) and returns parallel to its previous course; other six wefts now sinistrals; edge formed on left by turning up lowest sinistral (5) with upward half-turn to cross sinistral 1 above it and function as dextral; other sinistrals (1-4) successively turned up with upward half-turn and function as dextrals; lowest dextral on right (6) takes upward half-turn and crosses the others as last sinistral, when it is left projecting at left edge; sinistral 7 takes half-turn across top sinistral (6); again, six dextral wefts; these plaited in three-ply braid, first ply being formed by middle wefts (2, 3); two lowest wefts (5, 1) form second ply which crosses first while remaining two upper wefts (4, 7) form third ply which crosses second ply; three plies plaited in free tail (8) and knotted; end of free weft (6) on right simply knotted to crossing weft (7); coconut leaflet (9) knotted around first leaflet (1) on right; leaflet 9 and braid tail (8) used as strings to tie at back of head to keep shade in position.

PLAITING WITH LAUHALA

MATERIAL

The hala (*Pandanus*) grows on all the islands without cultivation. Though *whara* is the general name, that term is especially applied to the mature plant which has developed a long trunk. The young plant which has no length of trunk is distinguished as *puwhara;* and it is from this plant that mats and clothing are made, whereas the leaves of the *whara* serve for roof thatch. The preparation, according to my informants, is as follows:

The *puwhara* is cut down and the leaves cut off. The leaves are individually passed over the fire (*parara ki te ahi*) and then exposed to the sun (*haumaki ki te ra: haumaki,* expose to the sun; Cook Islands, *tauraki*) for two days. The spines on the

back of the leaf midrib are removed by splitting off with the teeth the strip carrying the spines. A pearl shell implement is used to smooth out the leaves. If the shell is large it is called *parau* but if small, *kati*. The butt end of the leaf is held with the left hand and the shell is run along the under side of the leaf. This process (*vautua*) spreads out the wrinkles caused by drying and smooths and softens the material. The leaves are again exposed to the sun for three or four days.

Each leaf is then wound around the hand, commencing with the butt end. This opens out the leaf. A reverse winding is then made on the other hand, which leaves the butt end on the outside. The side edges (*papita*) of the leaf are split off (*tete*) with a *kuku* shell. Other leaves are added to form a large roll (*pipiti*). The process of rolling is termed *tupe*. The end of the added leaf is always placed under the end of the preceding leaf. The *pipiti* rolls are fastened with a strip of lauhala passed through the central hole and tied around one radius of the roll. These are stored for use.

In preparing the material for plaiting, the roll is first beaten on the ground (*ka tuki te pipiti*). The leaves are again scraped (*haro*) along the back with a shell to soften the material (*kia paruparu*). The leaf is split off on either side of the midrib, which is discarded. The worker then deals with the half leaves. The butt end of the leaf is the *pu* and the tip end, the *hiku*. The half leaf is split (*tete*) into wefts of the desired width. Mats with wide wefts are termed *kiri maraia* and those with narrow wefts, *moenga kuti*.

In plaiting mats, double wefts (*tuarua*) are used. To form a double weft, the dull surfaces of the wefts are placed in opposition so that the shiny (*tua*) surface will be exposed on both sides of the double weft.

MATS

The mats made from lauhala are used for sleeping upon and are hence termed *moenga* (*moe,* to sleep). The *tua* surface of the lauhala of the warmer atolls seems to have a better appearance than the material used in the Cook Islands. The women of Manihiki and Rakahanga are regarded as good plaiters. The sleeping mats made of double wefts and embellished with colored designs in overlaid plaiting are much admired and sought after. The commencement technique is as follows:

As applied with double wefts, the commencement technique (*whatu*) does not differ from that of the Samoan *papa* mats (28, pp. 214-216) which may be compared for technical details. (See pl. 6, *C*.)

The plaiting stroke throughout is the check. Colored designs are worked in after the completion of the mat with overlaid material formed of the upper layer (*papa*) of the lauhala separated in thin sheets after heating the leaf. The material is now dyed with trade dyes. It is split to the same width as the mat wefts, and geometrical designs are worked by filling in a series of weft squares. Dextral strips to cover the dextral squares are pushed under the crossing sinistrals. The sinistrals are then covered by sinistral strips which are pushed under the crossing dextrals. Large designs are worked and give a pleasing effect.

The length of a mat is *roa* and the width, *kakano*. The edges are termed *tamore*.

BASKETS

Baskets are now extensively made from lauhala, but little doubt can exist that this form of the craft has come in by diffusion from Cook Islands in the post-missionary period. However, the baskets warrant a brief description, for, though comparatively recent, they are nevertheless essentially Polynesian in technique and have been adopted and varied in the local culture. The lauhala baskets are of two types, the two-cornered and the four-cornered satchels:

1. The two-cornered satchel (fig. 42; pl. 5, *A*, *2*). This basket conforms in all details except ornamentation to the baskets made in Cook Islands. The wefts are single strips 0.15 inch to 0.2 inch wide. The check stroke is used throughout. The basket is plaited like a strip of mat for twice the required length. The ends are brought together and the triangular gap filled in by plaiting the free marginal wefts of each end. This forms a plaited cuff, or cylinder, which is plaited in sections to the required depth. The cuff is turned inside out and the sides brought together to compress the bottom opening into a longitudinal line.

The bottom is closed (fig. 42) along the longitudinal line in a simple manner by check plaiting in two courses, which is really the beginning technique of a braid which is not developed by twisting in the plies. The dextral and sinistral wefts on either side of the median line run in opposite directions. In the first course the set of wefts on either side that inclines toward the plaiter is used, and in the second course both sets are finally disposed of.

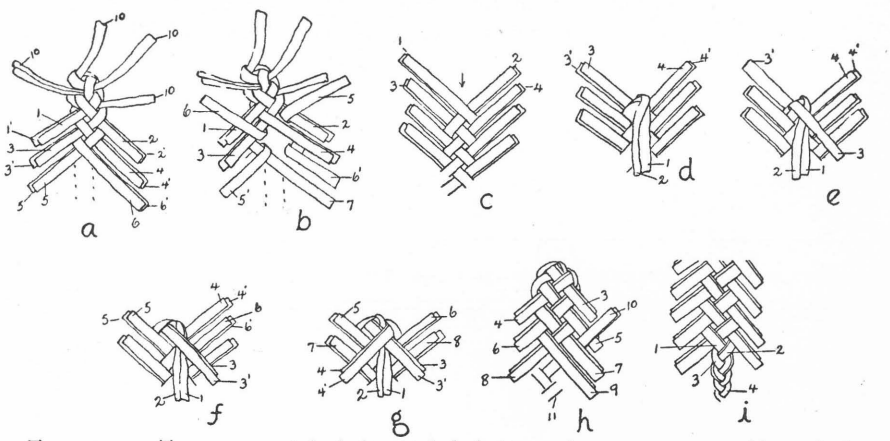


FIGURE 42. Two-cornered lauhala satchel, bottom closure. *a*, to avoid confusion, it is convenient to apply term "inward" to wefts on either side directed toward the plaiter and "outward" to those directed away from her; plaiting commences on far end of longitudinal line forming unclosed bottom; in making start, certain wefts (10) do not readily fit into scheme of check crossing and are left out to be disposed of later; selecting inward weft (1) on right, this is crossed diagonally over middle line in its natural course; on left, inward weft meets outward weft (1′) which is bent back over its crossing weft (4) and lies paired with inward weft (1) above it; next inward weft (2) taken from left and crossed over previous inward weft (1) in check stroke; meets outward weft (2′) on right, which, in turn, is bent back to form paired weft; right inward weft (3) crosses over in check and turns back outward weft (3′); similarly inward wefts (4, 5, 6) crossed in check from alternate sides and each pair with outward wefts (4′, 5′,

6′) on opposite sides which are turned back under them. *b,* right inward weft (5) raised; complementary outward weft (5′) doubled back over its crossing weft (7) and ready for inward weft (5) to be crossed over weft 4 in check technique; next inward weft (6) raised while its complementary outward weft (6′) bent back ready to receive inward weft (6) on its upper surface when next check stroke is made; thus inward wefts form check crossings of single elements to close longitudinal open slit of bottom, but when they cross, they turn back corresponding outward weft and form double wefts on far side of middle line; this continued for length of bottom; first course thus closes opening with crossed single wefts, but technique arranges all wefts into double wefts directed toward plaiter on both sides of middle line. *c,* bottom reversed so double wefts on either side of middle line of single checks directed away from plaiter. *d,* second course commences at far end by doubling first two double wefts (1, 2) down middle line. *e,* double wefts plaited in check alternately from either side, but as they consist of double elements, it is better to deal with each individually; double weft on left selected as first to cross; its upper element (3) doubled back across middle line thus exposing under element (3′) which was originally a doubled-back outward weft. *f,* doubled-back under element (3′) straightened out over its pair mate (3). *g,* double weft (4, 4′) on right crossed over in two similar movements. *h,* technique established and double wefts (5, 6, 7, 8, 9) successively crossed from alternate sides; under elements of wefts pulled taut so as to make check technique close and firm; double weft (9) last to be brought over from left to cross preceding weft (8); next weft (10) from the right has been covered by weft 7, which has to be lifted to allow weft 10 to be turned back over weft 9 in middle line; so throughout plaiting. *i,* last two double wefts (1, 2) on near end of mesial line crossed and continued with loose elements left out of commencement (*a,* 10) shown as 3, continued as free braid tail (4), and finished off with overhand knot; in second course, check stroke made with double wefts over middle line; weft ends, if too long, cut to form short fringe on either side as shown.

The rim is finished off with a last working section to form serrations after the style of the pointed *pite* (fig. 33). Below the serrations the wefts are carried on in a plaited band to fix the weft ends. The technique is exactly the same as in the lauhala baskets of Aitutaki (*27,* p. 197). The basket is turned again and the bottom closure with the finishing rim cuff is concealed within. A handle of plaited lauhala is sewn on by the ends to the middle of the inner sides of the rim. Various designs in overlaid plaiting are made on the sides with the thin *papa* material in color.

2. The four-cornered satchel (figs. 43, 44; pl. 5, *A, 5-6*). This basket has come into great favor and large numbers are made to give away as gifts to friends and visitors. Single wefts are used with the check stroke. The technique differs in principle from the two-cornered basket. In the two-cornered satchel the corners are formed by the ends of the straight braid which closes one opening of a plaited cuff. In the four-cornered satchel the bottom is formed of plaited material first, and four corners are then turned, from which the wefts are directed upward at right angles to the bottom plane to form the sides and ends. (See fig. 43.) The size of the bottom varies. A fair average for the smaller satchels is 8 inches by 2.5 inches. The shape also varies, from rectangular to square. The plaiting of the sides and ends continues by working sections until a depth of 5.5 inches or more is reached. The upper edge is formed by turning down the top dextral at the working edge to lie on the sinistral placed in the shed. This is done successively throughout the length of the rim. The lower ends of the turned-down dextrals are left projecting on the outer surface. These are afterwards cut off, and the free ends are tucked in under a crossing weft and are thus not seen from the outside. The rim forms a smooth, even edge from the downward half-turn of the dextrals. (For detailed technique see *27,* p. 202.)

Some of the satchels are finished off at the rim by a wrapped band laid along the outer side with another laid along the inner side. These two bands are stitched to the rim with a steel needle and cotton thread. Handles are formed of plaited bands from 0.3 inch to 0.6 inch plaited in the round in check and then flattened out. In

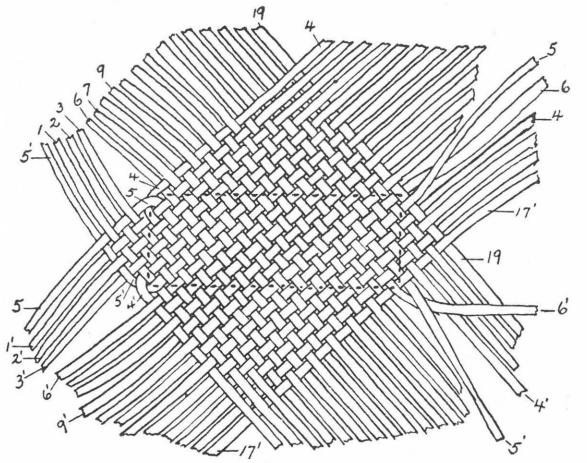


FIGURE 43. Four-cornered satchel, bottom and corner technique. Wefts plaited in check until area indicated by dotted lines is large enough to form bottom; with plaited bottom before her, plaiter selects suitable line of width on left; this line, indicated by left vertical dotted line, runs out at edges of plaiting above (far) and below (near); at these points corners formed by crossing two adjacent wefts at right angles to their previous course—in upper left corner, 4 and 5; to comply with check technique, weft 5 crossed over 4 and each plaited in check with set of wefts it encounters; lower left corner formed in similar way, 4′ over 5′; plaiting sections to outer sides of left and far dotted lines marking bounds of bottom are bent up at right angles, and gap at upper left corner between near series (5′-3) and far series (6-9) is closed and the two series will cross each other diagonally; nothing remains but to interlace them in check plaiting until corner clearly defined and part of far side and left end of satchel completed; near left corner treated similarly; to form corners on right, plaiting of bottom must be continued to right until length of bottom secured by coincidence of right vertical dotted line with far and near edges of plaiting; in figure, bottom will be slightly wider on right than left; this due to error in counting, illustrates what sometimes happens in actual plaiting; plaiter, realizing mistake, would uncross wefts 5 and 6 and remove weft 19, uncross wefts 5′ and 6′ at near corner and remove weft 17′; corners would be built up in same way on left.

some bands, colored elements are introduced which form a check pattern. The handle is single and long, the ends being sewed onto the inner side of the middle of the side rim with cotton thread.

A still more modern note is struck in some of the wider bottomed satchels. The ends are bent inward by creasing the middle. The sides of the rim are brought together and kept closed with a dome fastener sewed to the inner side of the rim. The resemblance to the ladies' handbags of western culture is striking, and the idea was probably obtained from them.

The wide range of the geometrical designs used included the chevron, triangle, and lozenge in various combinations, together with more complicated figures, as shown in figure 44.

3. Fine coconut leaf satchel, technique derived from the lauhala two-cornered satchel. The satchel figured in plate 5, *A, 3* is fairly modern. The material is obtained from the leaflets of the young unopened leaves in the middle of the leaf head. These are cut off from the midrib and boiled for a few minutes, when the upper shiny surface of the leaflets can be split off from the under surface in much the same manner as in procuring the *papa* material from lauhala to provide the colored wefts for overlaid plaiting. The thin coconut material becomes very white on drying, and narrow

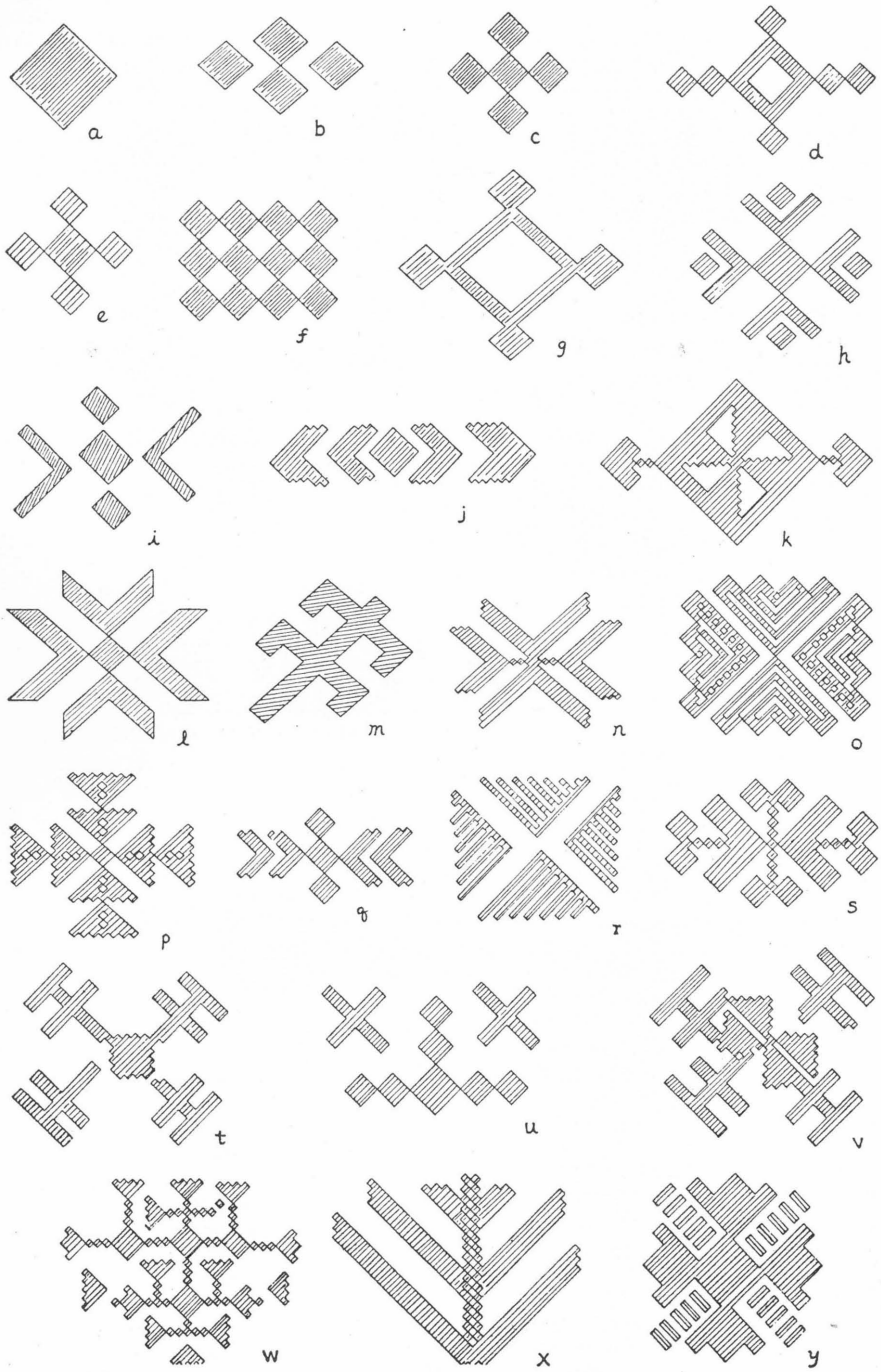


FIGURE 44. Lauhala satchels, color designs. (Drawn by C. K. Hedemann.)

strips are folded longitudinally with the shiny surface showing on both sides. Much finer work can be done with the material, and in the satchel figured, 17 or 18 wefts to the inch were used.

The satchel is made in exactly the same way as the two-cornered lauhala satchel as regards the serrated rim and bottom closure, but the plait is in twill, which is changed to various combinations to obtain structural decoration.

The use of the specially prepared coconut leaflet material is a comparatively recent introduction and was stimulated by the fashion of making hats of the Panama type. The first person to use the coconut leaf was a woman from the Gilbert Islands who had married a Rakahangan. She, however, kept her process of preparing the material a secret. For a considerable time the Rakahangan craftswomen puzzled over the excellence of the material and endeavored to solve the secret. At last one struck upon the method of boiling the leaflets to enable them to be split. The discoverer of the method proudly told me that her method was superior to that of the Gilbert Islands woman who, as it was subsequently found when secrecy was useless, ran the leaflets quickly over a lighted fire. From then on, the people of the atolls used coconut leaflet instead of lauhala for their hats, which are beautifully made and provide some income.

FANS

Fans (*tahiri*) are made from the ordinary coconut leaf dried to a brown color in the sun and from the beautifully white prepared leaflets now used in the manufacture of hats. The brown fans are made of sections of leaf midrib with the bilateral leaflets attached naturally. A part of the midrib serves as a handle. The closed leaflets are generally plaited in check, but sometimes the twill is used. Two varieties of brown fan were seen, one composed of a single section of leaf and another of two sections, and one type of white fan:

1. Single-section fan (fig. 45) made of a midrib section 11 inches long with nine pairs of leaflets. Technique shown in the figure.

2. Two-section fan (fig. 46) made of a piece of midrib 8.25 inches long carrying five pairs of leaflets and a shorter piece 7.5 inches long carrying four pairs of leaflets. Technique shown in the figure. A larger two-section fan, plaited partly in twill, is shown in plate 5, *B, 3*.

3. The white fan (pl. 5, *B, 1-2*) is neatly made of individual doubled wefts doubled around a thin wooden handle. The handle consists of a rod about 0.6 inch in diameter, which is left at its natural thickness for 4 inches and then cut down to a thin rod for about 9 inches to give support to the wefts. The wefts are added from the handle upward, each weft being doubled around the rod and plaited in check over the front in much the same manner as the two-section brown fan, the rod supplying the place of the leaf midrib. The wefts are then plaited in twilled-twos and twilled-threes and finished off in check toward the curved distal end. A fringe of dyed *tou* bast 2.75 inches long is caught in the plaiting and gives a characteristic finish. The fan is really a modern adaptation of the technique of the brown fan in plate 5, *B, 3*, and a detailed description of technique is unnecessary.

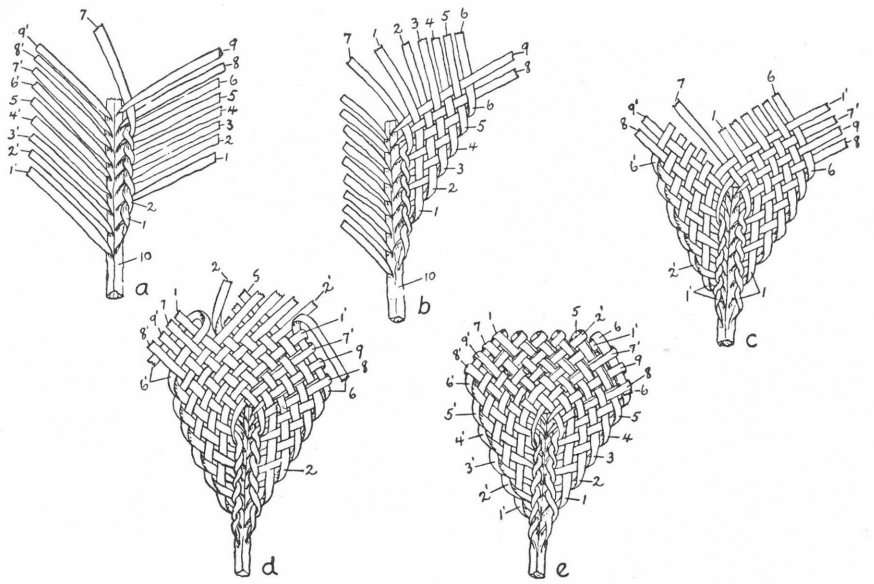


FIGURE 45. Single-section coconut leaf fan, leaflets short in figures to save space. *a*, butt end of midrib proximal with natural upper surface upward; leaflets kept closed with leaflet midrib forming far edge of wefts; leaflets on right twisted forward under butt end of leaflet in front, commencing from butt; thus nearest leaflet (1) twisted under leaflet 2 in front of it and 2 under 3, 3 under 4, in succession until leaflet 6 twisted under leaflet 7 in front of it; this ends twisting, for leaflet 7 acts as locking weft by passing over 8, under 9, to be drawn toward left to lie parallel with left end weft (9′). *b*, right leaflets plaited in check, nearest (1) being bent with upward half-turn to run parallel with midrib (10) and pass over and under intervening wefts (2-9) in check technique; next weft (2) similarly treated and so successively are wefts 3-6, upward half-turn of each weft places midrib edge of closed leaflets on right; when sixth weft (6) turned, remaining two wefts (8, 9) left as they are. *c*. left leaflets twisted in similar manner to those on right as far as sixth (6′); seventh (7′) crossed over to other side as locking weft but in fan examined crossed over both 8′ and 9′ instead of under 8′ and over 9′ due to slip in technique; wefts 1′ to 6′ bent successively with upward half-turn and continue check technique; last two wefts (8′, 9′) left as they are; left wefts (7′, 1′) carried across in check technique through right wefts to reach edge on right defined by weft 6; left wefts (2′-6′) cut short after crossing weft 9′, but in practice are full length; when plaited portions tightened up, right weft (7) will come over to left and lie parallel to 9′. *d*, wefts from right have crossed over to left and those from left, to right, check stroke being continued; dextral wefts (8, 9, 7′, 1′) on right edge have been doubled over weft 6 to define right far edge and ends passed down under crossing wefts which keep them in position, any excessive length being torn off; similarly on left, sinistrals 8′, 9′, 7, and 1 will be doubled over bounding weft (6′); when wefts above crossing weft (6′) as 8′ and 7, they are doubled over backward and when they are behind as 9′ and 1, they are doubled forward; bounding weft (6′) doubled backward on itself and passed under crossing wefts to fix it. *e*, in completed fan bounding weft (6) on right has been doubled over first weft (1′) and then passed under crossing wefts (7′, 9, 8) where its cut-off end projects on near side of 8; similarly on left, bounding weft (6′) has been bent backward around the first weft (1) and at back under crossing wefts (7, 9′, 8′); intervening weft ends dealt with in pairs of which sinistral weft under dextral; first pair on right (5, 2′ in *d*) supplies the technique; under sinistral 5 doubled over dextral 2′ and follows its first part by passing under crossing wefts 7′ and 8; the dextral weft (2′) doubled over second part of 5 and passes under crossing wefts; other three pairs similarly treated and fan completed with straight serrated edge.

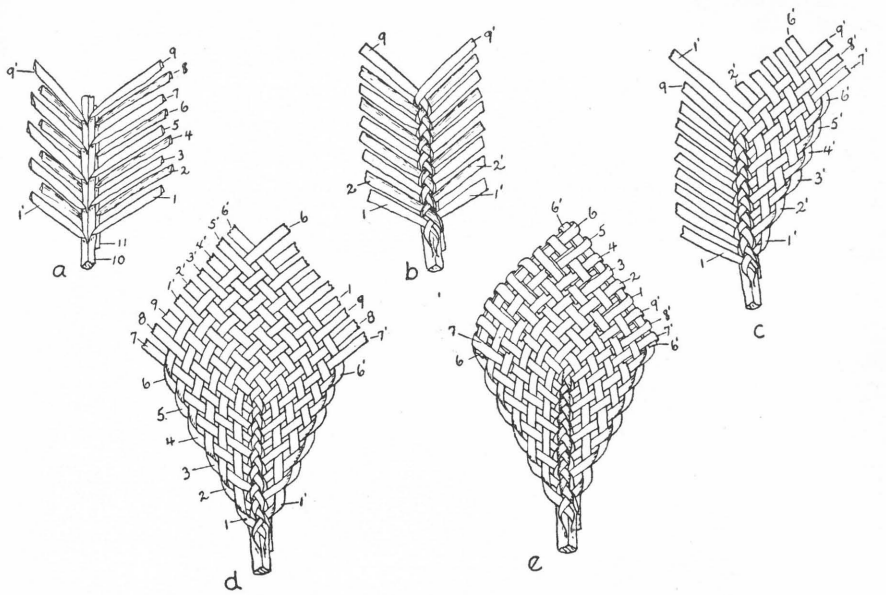


FIGURE 46. Two-section coconut leaf fan. *a,* longer section (10) with five pairs of leaflets placed above shorter section (11) with four pairs of leaflets, so that leaflets of under section fall into intervals of those of upper section; lower section leaflets shaded in figure; thus nine leaflets on either side. *b,* leaflets alternately crossed to opposite sides, commencing with right side; right upper leaflet (1) crossed to left and left upper leaflet (1′) crossed over it to right; next lower leaflet (2) on right crossed over preceding crossed leaflet (1′) on its way to left and next left lower leaflet (2′) in its turn crosses over preceding crossed leaflet (2) on its way to right; each leaflet crosses alternately from either side and either section until all leaflets have crossed concluding with 9′ over 9. *c,* nearest right leaflet (1′) bent with upward half-turn, passes under next leaflet (2′), and runs parallel with midrib to cross all successive leaflets (3′-9′) in check stroke; next right leaflet (2′) similarly treated and so in succession to sixth leaflet (6′); last three leaflets (7′, 8′, 9′) left as they are; first leaflet (1′) inclined to left as locking weft and made to lie parallel with left last leaflet (9); other right leaflets (2′-6′) turned in plaiting also incline to left. *d,* first six leaflets (1-6) on left successively bent with backward half-turn and plaited in check in similar manner to those on right; first of series (1) acts as locking weft and is inclined to right where it reaches right far edge defined by weft 6′; others follow suit and last three wefts (7, 8, 9) on left unturned; all crossing wefts plaited in check and point of plaiting formed by crossing of bounding wefts (6′, 6). *e,* of two bounding wefts, under weft (6′) doubled over crossing weft (6) and brought back along its previous marginal course to pass under crossing wefts (4, 2, 9′, 7′) where its cut-off end projects on near side of last weft (7′); weft ends on right doubled over double marginal weft (6′), those above it (4, 2, 9′, 7′) being doubled back and passed under one or more crossing wefts to fix ends; alternate wefts (8′, 1, 3, 5) under marginal weft (6′) doubled forward over it and ends tucked under nearest crossing weft; left marginal weft (6) doubled over second crossing part of weft 6′ and interlaced in check corresponding to its former course where its end (6) projects on near side of last crossing weft (7); weft ends on left far edge treated in exactly same manner as on the right, wefts behind marginal weft (6) being doubled upward over it and those in front being doubled backward; fan thus completed with straight far edges which meet in median point.

CLOTHING AND ADORNMENT

Introduction

Clothing was further developed than in Tongareva. The Tongarevan perineal band of coconut stipule (*kaka*), which was the general dress of the men, was not used in Rakahanga. A more elaborate *maro* of fine plaiting was used instead. Kilts, capes, and poncho-like *tiputa* were also made. No form of weaving was known, and the craft by which the garments were made was plaiting. European textiles have completely displaced the old forms of clothing, but kilts and ponchos are sometimes plaited for festival dances and for presentation to visitors. Thus I was agreeably surprised on calling at Manihiki after our sojourn in Rakahanga to find that the people had of their own volition plaited kilts and ponchos for me as examples of their old-time garments. Though highly ornate, they gave some idea of the craft employed. Tupou-rahi also possessed a fairly old plaited *maro*.

Material

Two plants which enter largely into Polynesian clothing, the paper mulberry (*Broussonetia papyrifera*) and the ti (*Cordyline terminalis*), were absent from the two atolls as from Tongareva. Their absence precluded the manufacture of bark cloth (*tapa*) and ti leaf kilts. For clothing material, the plants available were the coconut and hala (*Pandanus*). It is curious that in Tongareva the people selected the coconut palm and used the stipule for the men's *maro* and the leaflets for the women's kilts and capes. In Rakahanga, owing perhaps to the greater plaiting dexterity of the people, the material selected was lauhala (*Pandanus* leaf). The leaves of the young hala (*puwhara*) entered into all the articles made, and the coconut was disregarded except to provide fiber for a belt. The upper layer of the lauhala was also split off, and the thin material (*papa*) was used for decorative purposes. The bast of the *tou* (*Cordia subcordata*) was soaked in sea water and used to provide fringes for the garments. A reddish-brown dye was obtained from the *nenu* (*Morinda citrifolia*), but now imported trades dyes have taken its place.

Women's Garments

Women's garments enumerated were the double apron and kilt (*tipora*), the cape (*pikipiki*), and the poncho (*tiputa*).

1. The double apron form of *tipora* consisted of two rectangular pieces (*tautape*) of plaited lauhala. These were used in conjunction with a sennit belt (*tukaha: tu,* belt; *kaha,* sennit braid). Whether the *tukaha* was a particular form of belt like the many-stranded *tu* belts of New Zealand or merely a length of sennit braid was not made clear.

The two *tautape* were of different sizes, the longer one being slung over the belt in front to conceal the genitals, and the smaller one being hung over the back. The two *tautape,* with the sennit belt, constitute the *tipora;* but sometimes the term *tautape* is loosely applied to the whole combination.

2. The kilt form of *tipora* (fig. 47) consisted of a long *tautape* (*tautape roa*) piece of plaiting which completely encircled the waist and thus acted as a narrow kilt. Some confusion existed between different informants, one maintaining that the narrow kilt with a hanging fringe was termed a *mahere,* and another that the *mahere* was the short perineal band. The kilt in plate 6, *B,* consists of a long, narrow band plaited in check with overlaid wefts of the thin *papa* material dyed red. The separate fringe of dyed *tou* bast, which is attached in a continuous piece to the upper and lower borders and both ends, is described in figure 47. The two-cord attachment to fix bast elements in a short fringe is exactly similar to the technique used with longer strips to make kilts in the Cook Islands (*27,* p. 88) and Samoa (*28,* p. 254). The method of sewing the lauhala strips to the plaited band is modern and is due to the introduction of needles and cotton thread. It is probable that in the original garments the wide lauhala strips were split at one end into wefts, which were plaited to form the band to keep the hanging lauhala strips together.

3. The cape (*pikipiki*) was also plaited with lauhala wefts, but the exact technique has been forgotten, as capes have long been out of use. Capes were worn over the shoulders and tied (*ruruku*) in front at the neck. They were stated to be women's garments, but were also worn ceremonially by men when going to the religious inclosures, or maraes.

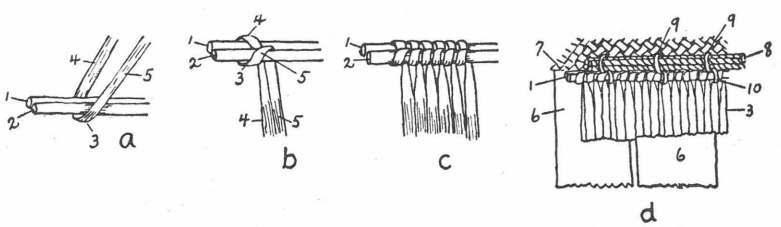


FIGURE 47. Kilt and fringe technique. *a,* strip of *tou* bast (3) about 3 inches long, dyed red, doubled under two cords (1, 2) composed of strips of young coconut leaflets boiled and bleached white; doubling of strip of bast in middle forms far limb (4) and near limb (5). *b,* both bast limbs (4, 5) brought over two cords (1, 2) and passed down between them. *c,* strips of bast added successively to right and kept close together so that cords (1, 2) hidden by turns of the bast; in type kilt, fringe is 86 inches long. *d,* strips of *papa* lauhala (6) attached to inner side of lower edge of plaited band (7); strips range in width from 2.5 inches to 3 inches and are 28 inches long; strips doubled to half their length and the two ends sewn together with cotton thread to plaited band; two-ply twisted cords of white coconut leaflet used for decorative effect; four cords (8) bunched together are run along just above edge of plaited band on outer side; bast fringe (3) placed in position with its supporting cords (1) laid against edge of band (7) and just below decorative cords (8); cords and fringe attached to plaited band by single continuous thread of white coconut leaflet; stitch (9) passed through plaiting and around cords (8) from below upwards on outer side; after passing through plaiting above decorative cords, thread descends obliquely to right on back, passes under fringe cord (1) and makes stitch (10) over it to fix it to band; stitch around decorative cords (9) made and again thread passes to right on back to appear under fringe cord; in this way, by stitches 0.3 inch apart, both cords and fringe attached along all four edges of plaited band.

4. The poncho (*tiputa*) was plaited in check with prepared lauhala. (See pl. 6, *A*). A hole was left for the head so that the garment hung down in front and behind to the thighs or knees. The square-cut hole was decorated by a *tou* bast fringe made with the two-cord attachment as in the kilt fringe. The fringe was attached to the edge of the plaiting by a continuous colored bast thread which passed spirally around the fringe cord and through the edge of the plaiting. Another fringe was attached to the outer edges of the plaiting. This was composed of single strands of colored bast which were held down over the middle by two colored bast threads which passed along the edge in the plaiting strokes. The ends of the colored strands on the plaiting side were then turned outward.

Men's Garments

The men's garments consisted of two forms of perineal band. The perineal band is known generally as a *maro,* but the shorter form received the specific name *mahere* and the longer one, *taoa.*

1. The short band (*mahere*) was plaited in lauhala. It was 1.5 arm spans (*maro*) in length and 1 finger span (*ngahonu*) in width. The band was passed between the legs and the front and back ends were held in position by a sennit belt (*tukaha*), the ends falling over it. (*Ka huru mai i mua, ka huru mai i muri.*) If the band was long enough, it was passed around the waist after passing between the legs.

2. The long band (*taoa*) was from 4 to 7 yards long and about 2 finger spans wide. (See fig. 48.) The specimen of *taoa* owned by Tupou-rahi was made of fine plaiting with 10 wefts to the inch. Overlaid plaiting in thin *papa* material stained with native *nenu* dye was used for decorative effect. Twill strokes were used to relieve the ordinary check plait, and a colored fringe of *tou* bast was attached at either end.

The plaited *taoa* was a well-made garment and a marked advance over the coconut stipule *maro* of Tongareva. Being long, it was wound around the waist besides being passed back between the limbs. The long *taoa* with colored wefts and end fringes was used by people of higher status on festive or ceremonial occasions, whereas the short *mahere* was used as ordinary clothing.

Accessories

Headdress. Pieces of net (*kupenga*) were worn around the head like turbans by men on particular occasions such as consulting the gods.

Eye shades (*taumata*) have been described. (See p. 125.)

Neck ornaments (*takawe*) made of coconut leaf and hala were worn around the neck by the *whakamaru* chiefs when about to consult the gods. Their use inspired dread among the people, from association with this function.

Personal Decoration

It is unfortunate that no accounts of the first contacts of European voyagers with the atolls of Manihiki and Rakahanga seem to be available. The present population has had little handed down regarding the ornaments and personal decoration of early times.

Ribbons consisting of the thin white material peeled off from the *tua* surface of the closed young coconut leaves of the growing center (*rito*) were used. They were tied together in long thin streamers and stuck in the hair by women on festive occasions. The material (*kamuka*) corresponds in form and use to the *revareva* of Rarotonga.

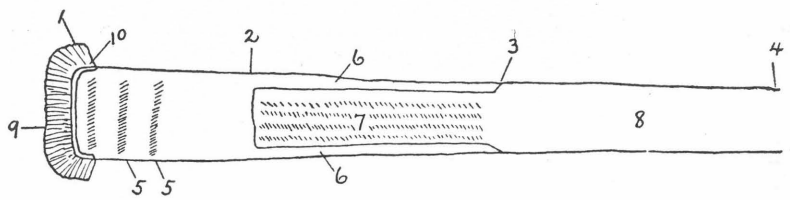


FIGURE 48. Long perineal band (*taoa*): from left end (1) to middle (4), length is 11 feet 2.5 inches, total length is 22 feet 5 inches; width (*patapata*) at ends, 14.5 inches, and in middle, 10.5 inches; end from points 1 to 2, 33.5 inches long, maintains width of 14.5 inches; this part colored with overlaid wefts and at intervals of about 8 inches, transverse rows (5) of twilled-threes relieve check; length between points 2 and 3, 45.5 inches, and width gradually diminishes from 14.5 inches on left to 10.5 inches on right; narrow parts (6, 6) at either edge carry on colored overlaid plaiting, but middle part (7) is plain white check plaiting relieved by four longitudinal rows of twilled-twos; beyond ends of colored strip (6, 6), middle part of band (8) plain; right half of band repetition of left half; fringe (9) of *tou* bast dyed with *nenu,* 4 inches deep; extends across ends, continued for 3 inches along sides; narrow strip (*peipei*) (10) consists of stained *papa* material, doubled and split on free edges to within 0.15 inch of doubled edge; this laid on edge of plaiting with split parts directed outward; as each side weft of plaiting reaches edge margin, turned in over split portion of *peipei* and so fixes it in position as part of fringe; strips of *tou* bast also added (*whakaumu*) to split portions of *peipei* and fixed by plaiting edge; bast strips caught by middle, and end which projects in over plaiting turned out to join other limb in fringe; when *peipei* split portions and bast have been fixed by plaiting, unsplit portion which lies on plaiting folded outward and thus covers split parts and makes neater finish; in finishing off edges, beyond *peipei* (10), plain wefts turned back in usual finishing edge technique observed in band finish of two-cornered satchels; in wefts overlaid with colored *papa,* colored material turned back but plain weft beneath left out and subsequently cut off; in narrow colored strips (6, 6) check stroke used throughout; edges of plain part (8) turned in finishing technique on under surface making narrow finishing strip about 0.2 inch deep; wefts cut off.

Neck ornaments (*takawe*). A form of ornament plaited from coconut leaf or lauhala was worn around the neck (*hei ki te kaki*) by the *whakamaru.* The appearance of these ornaments was regarded with a certain amount of fear by the public, as it was known that the wearer was about to consult his god.

Breast ornament (fig. 49). Edge-Partington (6, series 1, p. 62, no. 5) figures a breast ornament and describes it as, "Breast ornament of pearl shell in shape of fish." The ornament is 7 inches long, much larger than the shank of an ordinary bonito hook. Such ornaments were not mentioned

to me. The addition of two short strings of beads attached at one end to a hole in the shell resembles the post-European technique of Melanesia, to which area the ornament may belong.

Tattooing was not indulged in until after European contact.

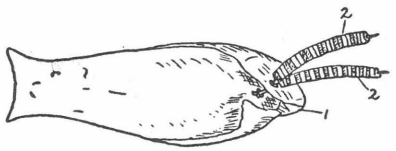


FIGURE 49. Ornament of pearl shell: 1, head cut through hinge of shell; 2, apparently two strings of beads, carried by hole pierced through projecting edge of hinge. (After Edge-Partington.)

STONEWORK

MATERIAL

Though a low-lying coral atoll does not supply suitable basaltic material, a good deal can be done with coral boulders and coral limestone slabs. Rakahanga and Manihiki, however, do not show the activities in available material that characterize Tongareva. The outstanding Tongarevan features, house sites and religious inclosures, are lacking, and stone piers for canoes were not observed.

MISCELLANEOUS

House sites. The stone platform, according to my informants, was not used. The surviving native house on Rakahanga is characterized by the absence of any platform or stones marking the wall boundaries. This is in marked contrast to the platforms of coral boulders associated with the Rarotongan types of houses which have become popular. The platform was introduced with the type of house. Because the present modern villages occupy the sites of the old villages, any traces of the past that might have survived the changes of time have been obliterated. The custom of segregation within the present village sites from the earliest times prevented the establishment of houses on other islands that might have left traces of interest to the archaeologist. It seems true, however, that not only were no house platforms made formerly, but that even the marking of the wall boundaries with stone was non-existent.

Maraes. The scanty material concerning maraes is presented on page 208. Here again the segregation into three villages prevented the survival of a marae on an outer island.

Graves. (See p. 217.)

Boundary stones (*tuakoi*) were used in the village of Te Kainga.

Adzes

Stone adzes

Owing to the lack of suitable material, stone adzes are not to be expected on an atoll isolated from frequent communication with high volcanic islands. For material, the atolls had recourse to the shell of the *Tridacna.* It came as a surprise, therefore, that three stone adzes were procured in Rakahanga. I picked up a tanged adz on the old village site of Te Kainga. My attention was drawn to it from its color, which was darker than the surrounding pieces of white coral. A few feet away, Judge Ayson picked up a piece

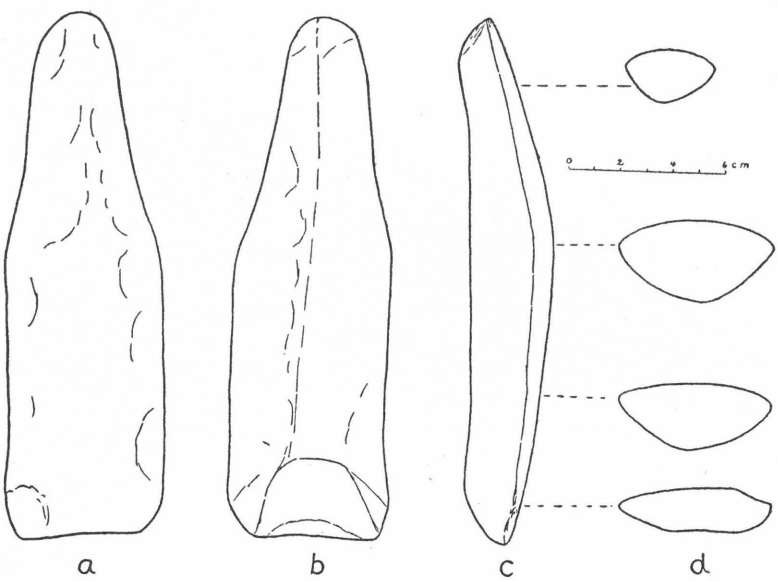


Figure 50. Triangular tanged adz (C. 2743). *a,* front: surface has marked longitudinal convexity; blade and butt surfaces continuous without any distinction except at side edges where shoulders formed by inward inclination of butt; blade slightly convex transversely, defined by well-marked side edges; blade width fairly even throughout; sides curve in slightly to cutting edge, more marked on one side; butt more convex transversely than blade; sides rounded off; adz narrows progressively toward convex poll. *b,* back: somewhat rounded median edge commences on back of butt, is fairly distinguishable in upper part of blade; in lower part of blade, median edge becomes less distinct and inclines slightly to one side of median line to meet bevel surface; median edge divides back into two postero-lateral surfaces which are convex transversely and meet front at well defined longitudinal edges; front side edges give adz affinity with triangular adz technique and make up for rounded posterior median edge; bevel surface evident, but lower part broken by concave depression which has marred cutting edge; owing to flattening out of median edge, chin curved in outline; upper part of butt slopes upward and forward to meet convex curve of poll. *c,* right side: front longitudinally convex; back concave; side edge continuous from blade to butt and over poll; butt slopes upward and forward to meet poll edge. *d,* cross-sections.

of similar stone, smaller and without a tang. The third adz had also been picked up on Te Kainga and was presented to me when the Rakahangan people made their parting gifts of farewell. Adz terminology is given by Hiroa (28, pp. 333-335).

1. Tanged adz (fig. 50; pl. 10, *C, 2*). The adz is made of a gray stone and has been so weathered that the general surface is smooth. It gives the general impression of a triangular tanged adz with a posterior median edge. The posterior median edge is not pronounced owing to the comparative thinness of the blade and the rounding off of the lower part.

2. Small triangular adz, without tang (fig. 51; pl. 10, *C, 1*). This fragment is regarded as an adz because it was found near the tanged adz and was of similar stone, though incrusted with a deposit of lime. The lower end was unfortunately chipped off some considerable time ago, for the white deposit completely incrusts it. The posterior median edge is well marked though rounded off by the incrustation. The lower end shows a trace of a triangular bevel surface.

3. Large quadrangular adz, with tang (fig. 52; pl. 10, *C, 3*). Whatever the doubts that may be occasioned by the preceding artifacts, none can exist with regard to the third adz. It is made of gray stone which has been ground throughout. It is characterized by a well-formed tang defined below by a deep convex shoulder and ending above in bilateral lugs at the junction with the poll. The longitudinal edges separating the four surfaces of the blade are well ground, and the two posterior ones are markedly concave. Owing to the pronounced longitudinal concavity of the back, the chin is prominent. The bevel surface is large and with the blade increases in width towards the cutting edge.

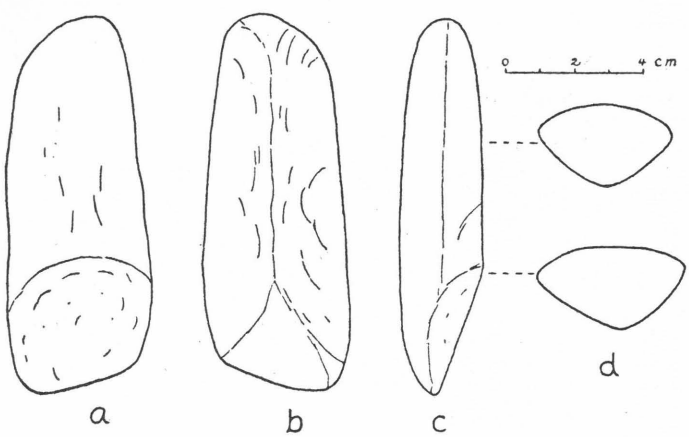


FIGURE 51. Triangular adz, without tang (C. 2744). *a,* front: surface slightly convex longitudinally and transversely; lower end shows loss of cutting edge by large chip fractured obliquely downward from before back; sides marked by distinct edges; surface narrows from cutting edge to poll formed by convex curve somewhat lower on one side. *b,* back: posterior median edge extends from just below poll and meets what was evidently triangular bevel surface at its apex; of bevel surface only trace of upper part remains but is sufficient to indicate that it was triangular; median edge divides back with two transversely convex postero-lateral surfaces which meet front in typical acute angled edges of triangular adzes. *c,* right side: longitudinal front edge continuous between blade and butt and continuous over poll. *d,* cross-sections.

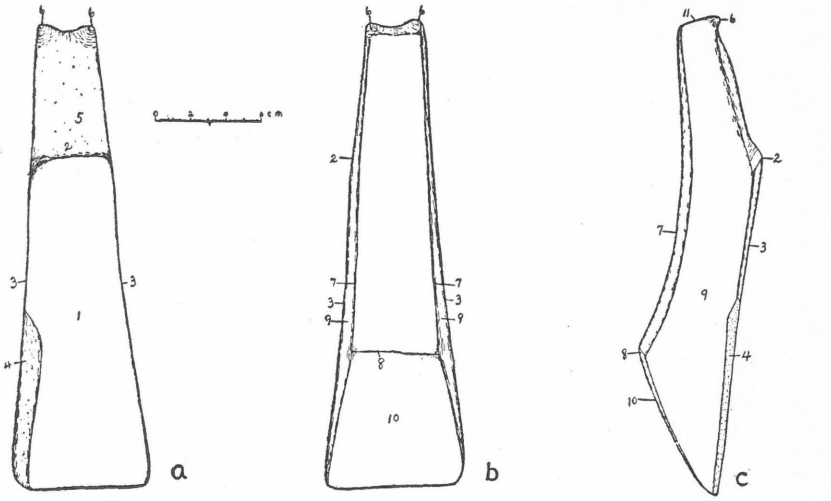


FIGURE 52. Quadrangular adz, with tang (C.2742). *a*, front: edge narrows slightly owing to rounding off of corners; adz slightly concave longitudinally and flat transversely except for slight rounding off of well defined side edges (3); long flaw (4) along one of side edges; shoulder (2) flat and forms convex curve toward tang (5) formed by grinding away front of butt and rounding off front longitudinal edges; tang inclines backward at angle with blade and narrows toward poll, where it ends in two well shaped bilateral lugs (6, 6) which come to rounded point with hollow between them. *b*, back: tang and blade surfaces continuous, concave longitudinally and slightly convex transversely owing to slight rounding off of back longitudinal edges (7); back narrower than front, and parts of lateral surfaces (9) may be seen; bevel (10) forms large surface, quadrilateral in shape, bounded above by straight chin (8), below by wide cutting edge, and at sides by well marked edges formed with lateral surfaces; bevel convex longitudinally and flat transversely, except near cutting edge where slightly concave. *c*, right side view: shoulder (2) and lugs (6) prominent; back has marked longitudinal concavity; poll (11) forms surface bounded by straight edge at back and concave edge in front due to contour of lugs; cutting edge well ground but blunt and shows no flaws or chips.

The quadrangular adz is exactly similar to an adz (fig. 53) discovered by the late Captain Allen on the island of Nassau, which lies to the west of Rakahanga. This adz was revealed by the slipping away of a bank, when it was seen sticking out from below the surface level. The adz was deposited by Captain Allen in the Australian Museum and afterwards given by him to the Auckland Museum, where it now is. It has been figured by Skinner (23, p. 92), who drew attention to the two lugs (poll-knobs) resembling those in Moriori adzes from Chatham Islands and in a less pronounced form from the South Island of New Zealand. The presence of lugs in the triangular adzes of the Austral Islands has also been remarked by Stokes (manuscript in Bernice P. Bishop Museum). The Nassau adz is a little larger than the Rakahangan adz, as the following figures, compared with measurements made by Skinner, show:

	NASSAU	RAKAHANGA
Length	12 inches	10¼ inches
Cutting edge	3⅜ inches	3 inches
Width at poll	1¾ inches	1¼ inches
Thickness at bevel	2 inches	2 inches
Weight	5¼ pounds	4 pounds (±)

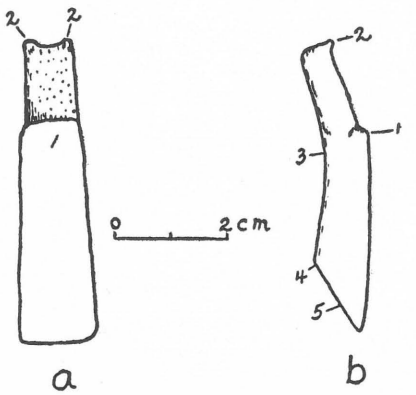


FIGURE 53. Quadrangular tanged stone adz with bilateral lugs, from Nassau Island: *a*, front; *b*, right side view. Convex shoulder (1) formed by cutting away front of butt to form tang with projecting bilateral lugs (2), marked longitudinal concavity of back (3), clearly defined heel (4) with corresponding thickness of blade and long slope of bevel (5) are also features of Rakahangan adz. (After Skinner.)

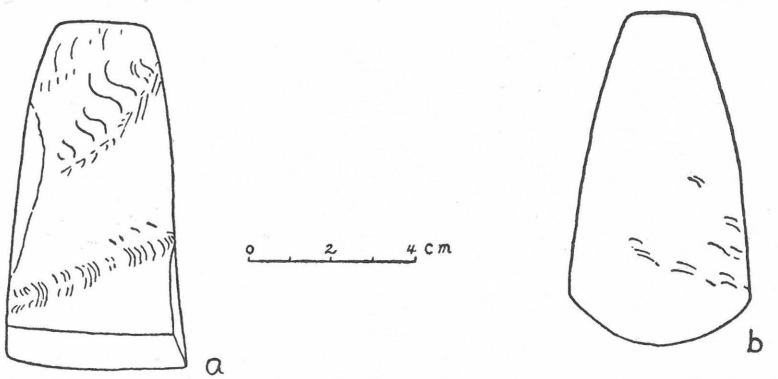


FIGURE 54. Adzes of *Tridacna* shell. *a*, adz in B. P. Bishop Museum (C. 2767): shell about 8 mm. thick but thinner in places owing to natural grooving of outer surface; outer surface of shell forms front, ground down in places to remove natural roughness; lower cutting edge fairly straight but curved up slightly at one end; shell fairly straight; bevel to form cutting edge, on front. *b*, adz in B. P. Bishop Museum (C. 2768): outer surface of shell forms front; shell curved, front distinctly convex longitudinally and transversely; lower cutting edge convex; bevel grinding on back; thickness, 5 mm.

Skinner states that the Nassau adz is of light gray volcanic tuff, and it is evident that the Rakahangan adz is of the same material. Little doubt can exist that the two adzes came from the same workshop, being formed of the same material and by the same technique. It would be interesting to know where that workshop was, for both adzes have evidently been introduced, if not by the same people, at least by people who had mutual contact in some part of Polynesia.

SHELL ADZES, HAFT

Two *Tridacna* shell adzes (fig. 54) were among the presents given to me on Manihiki. Though they were evidently made for the occasion, it is presumed that the form and hafting reflects the technique of the past. One of the adzes was hafted to a movable socket.

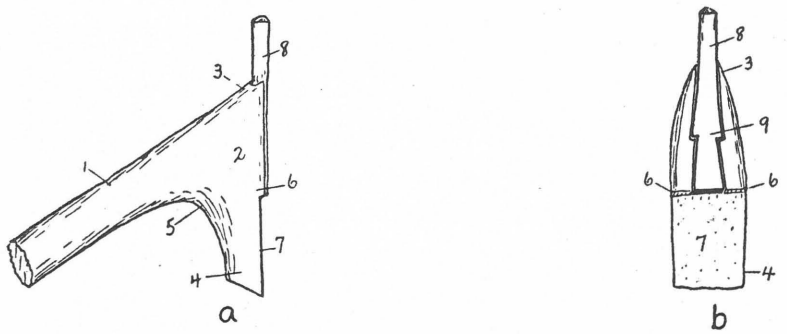


FIGURE 55. Adz haft, with simple mesial peg. *a*, side view: rounded branch shaft (1) meets trunk foot (2) with heel (3) above and toe (4) below; upper line of shaft runs straight to heel without forming heel angle, toe angle (5) formed below; toe cut to deeper level at shoulder (6) to form adz surface (7); mesial peg (8) in position; diameter of shaft, 1 inch; depth of foot, 4.6 inches; depth of adz surface, 2.2 inches; foot, 0.7 inch thick at lower end. *b*, front of foot: transverse shoulder (6) defines upper limits of flat adz surface (7) which is 1.4 inches wide below and 1.5 inches above; foot cut away in mesial line above shoulder to fit mesial peg which is 3.7 inches long and about 0.3 inch thick, and corresponds in depth to shoulder; peg, 0.6 inch wide at bottom, narrows gradually to 0.4 inch at point 9, widens out again to 0.6 inch, gradually diminshes to 0.35 inch, and projects above toe for 1.3 inches; peg thus doubly wedge-shaped to prevent upward displacement from pressure of adz poll when in use.

The hafts are of the shape typical of most Polynesian areas. The shaft is composed of an appropriate-sized branch and the foot of a piece of the trunk. The acute upper angle formed by the branch with the trunk is reversed and becomes the lower toe angle between the shaft and lower projecting toe part of the foot. The upper line of the shaft is continued to meet the front surface of the foot, and the point so formed is termed the heel. The upper heel part of the foot may or may not form an upper obtuse heel angle with the shaft. (See 28, p. 357; heel and toe angles in

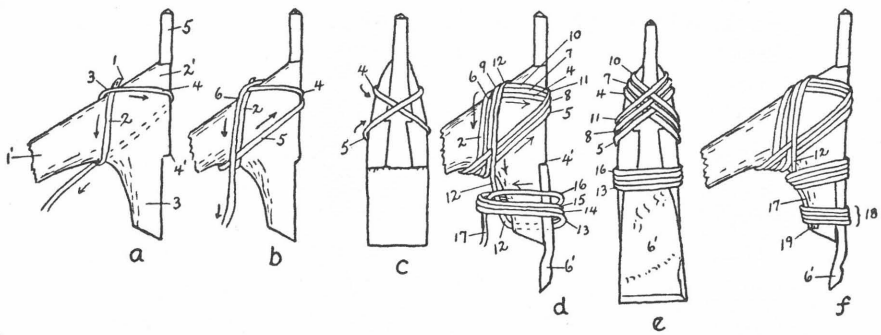


FIGURE 56. Lashing of simple haft: shaft, 1′; heel, 2′; shoulder, 4′; median peg, *a*, 5; adz, *d-f*, 6′. *a*, side: one end (1) of lashing braid crossed over middle line on back of heel and braid (2) brought down on near side of shaft, under toe angle, up on far side, and crossed (3) over end in upper middle line to fix it; braid continues horizontally (4) across toe, crosses front obliquely downward, and is brought down obliquely on far side to toe angle where it crosses first turn (2). *b*, side: from toe angle braid ascends obliquely (5) on near side, crosses obliquely upward over previous turn (4) in middle line in front, passes horizontally backward on far side of heel, and again crosses over previous turn (4) in middle line on back of heel to descend (6) on left of previous turn (2) to toe angle; one set of turns complete. *c*, front, crossing of descending turn (4) with ascending turn (5) in front middle line, after first set of turns. *d*, side: two more sets of turns made; thus from *b*, braid passed up on far side, crossed in middle line above to form second horizontal turn (7) above first one (4), crosses front and far side of foot diagonally downward to toe angle, ascends on near side to make diagonal turn (8) above first one (5), crosses horizontally backward on far side of heel, and makes downward turn (9) on near side to right of first buried turn (2); second set complete; third set ascends on far side to right of previous turns, crosses above in middle line to make horizontal turn (10) above previous turns (4, 7), descends obliquely across front and far side to toe angle, makes ascending oblique turn (11) above previous ones (5, 8), crosses horizontally on far side of heel, crosses over middle line above to form last turn (12) to right of previous turns (6, 9); repeated chevron pattern complete but continuous braid (12) carried down to make next series for fixing adz to foot; adz (6′) placed in position on foot and series of four loose turns (13-16) made over left thumb laid against toe, first turn (13) lowest and subsequent turns thus inclose descending braid (12); after last turn (16), end (17) of braid passed down through loose loops; loops (13-16) low in figure to avoid confusion with upper lashing, but in practice higher so that upper turn (16) will correspond with level of shoulder (4′). *e*, front: in repeated chevron pattern in upper lashing, ascending turns (5, 8, 11) cross in middle line with descending turns (4, 7, 10); loose turns of lower lashing have been drawn taut in turn, commencing with lower one (13), finishing with uppermost (16) which is level with shoulder and overlaps it; when last turn drawn taut, slack removed by pulling it down under turns by hauling on lower end (17 in *d*). *f*, side: from first transverse series, braid (17) on removal of slack carried down to make another series of four looped turns as in *d*, commencing from below upward, with end (19) pushed down under them from above; turns (18) drawn taut successively around lower end of foot; slack drawn taut and end (19) cut off close below lowest turn.

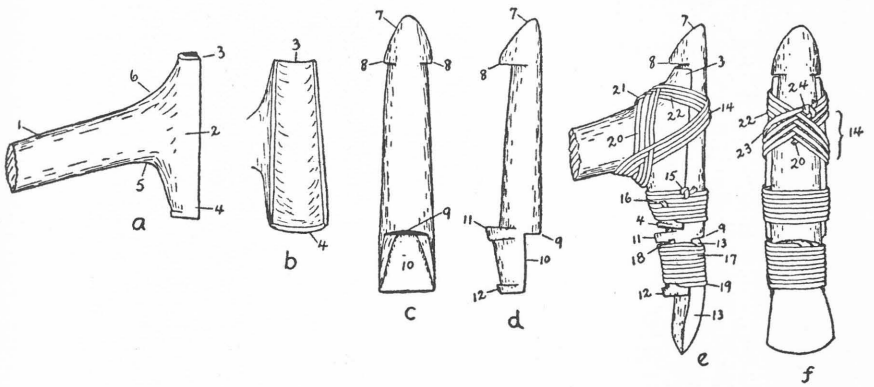


FIGURE 57. Haft with socket, and lashing technique. *a, b,* side and front views of haft: 1, shaft, 13.2 inches long and slightly more than 1 inch in diameter; 2, foot, 4.5 inches long, front grooved throughout length to fit back of rounded socket; 3, heel, 0.6 inch deep and 1.1 inches wide; 4, toe, 0.8 inch deep and 1.5 inches wide; 5, toe angle; 6, heel angle; differs from simple haft in presence of heel angle. *c, d,* front and side views of socket of hard *ngangie* wood: 7, blunt pointed knob, 1.2 inches high, 1.1 inches wide, and 1.1 inches thick at base; 8, heel shoulder, extends from back to sides and rests on haft heel; 9, shoulder, 0.4 inch deep and 1.4 inches wide; 10, flat surface 1.6 inches long cut to shape of adz butt; 11, toe shoulder, section 4.6 inches long between toe shoulder and heel shoulder rounded off to fit against groove of haft foot and allow socket to rotate; 12, slight flange on back, section 0.3 inch long between flange and inward cut below toe shoulder receives adz lashing; length of socket, 7.6 inches; diameter at lower end, 1.3 inches; thickness at base of knob (8), 1.1 inches and just below knob, 0.8 inch; thickness at shoulder (11), 1.4 inches and just above, 1.1 inches; thickness at lower end, 0.6 inch. *e, f,* lashing, side and front views: heel shoulder of socket fits above haft heel (3) and its toe shoulder (11) below haft toe (4); socket first attached to haft by repeated chevron lashing (14) which makes turns around heel and toe angles, technique of turns similar to that in simple haft lashing (fig. 56, *d*); second lashing of transverse turns around socket and toe is commenced with slip knot (15) for first upper turn; turns pass from right to left on near side; last three turns made over thumb, end (16) passed upward beneath them, turns drawn taut from above down, slack drawn taut, and end cut off; adz (13) fitted to adz surface on lower end of socket with poll resting against adz shoulder (9) of socket; lashing commenced by turning down one end (17) of braid on adz and making number of loose transverse turns over thumb under which other end (18) of braid turned up from below; turns drawn taut from above down, first three turns fixing and concealing first end (17); last turn (19) drawn taut by pulling on end (18) to remove slack; slack cut off and end fixed; commencement and ending technique differ from that in simple lashing (fig. 56, *d*); end (20) of braid laid obliquely across middle, braid forms lowest ascending turn on right, and after passing around right side of heel crosses middle line above, descends on left or near side of shaft (*e,* 20), crosses under toe angle, ascends shaft on far side to cross itself above (*e,* 21), whence it crosses toe (*e,* 22) on near side to appear on left side (*f,* 22) to descend obliquely over front and cross commencing end in middle line; this establishes order of first set of turns and three more sets follow; last ascending turn (23) carried over middle line and tied with overhand knot (24) around two upper turns on right to fix lashing.

fig. 205, interchanged by mistake.) Sennit three-ply braid is used in lashing the adz. The hafting technique is as follows:

1. Simple haft (fig. 55, pl. 10, *C, 5*). The front surface of the foot is cut away to form a projecting shoulder to prevent the adz from working up on the foot. A slot, in which a mesial peg of hard *ngangie* wood has been fitted, has been cut in the front middle line. The mesial piece is wedge-shaped with the base below, and the upper end projects above the heel to form an ornamental projection. The inserted piece is of harder wood than the haft and has evidently been used to replace the pith canal of the foot and thus give the upper end of the adz something hard to rest against. The method of lashing the adz (fig. 54, *a*) to the simple haft is shown in figure 56. The decorative motive used is the repeated chevron which is produced on the front, the back of the heel, and on each side of the toe angle. This lashing, besides being decorative, holds the median peg in position, but does not affect the adz. From this first upper lashing, the braid is carried down and lashes the adz to the toe by two series of transverse turns.

2. Socketed haft (fig. 57, pl. 10, *C, 4*). The adz with socketed haft was obtained on Manihiki, and the type was said to have been used in the atolls in olden days. A socket has been defined (4, p. 178) as "an intermediate wooden piece by which the adz may be attached to the haft. It may be fixed or rotating." The Manihikian haft, socket, and lashing of the adz are described in figure 57.

In discussing the socket, Skinner (4, p. 178) states, "In Polynesia the primary function appears to have been the attainment of greater security of attachment, though in the Ellice Islands, rotation of the adze or axe was the principal function." The rounded character of the Manihikian socket enabled it to be rotated in the rounded groove of the haft. The two upper lashings attached the socket to the haft, but it could be rotated quite readily under the lashings. The third lowest lashing fixed the adz immovably to the flat surface cut on the lower end of the socket. By grasping the lower end of the socket with the adz, the line of the cutting edge may be turned obliquely to its normal transverse position with regard to the long axis of the haft. In this position, it was easier to dub out the narrowing hold of a canoe toward the bow or stern. The craftsman could still swing the implement in the long clear axis of the hold and adjust the socket to suit any angle and either side.

CANOES

Material

The old types of canoes have completely disappeared, even to the small dugouts used in fishing. The people are good artisans and quickly picked up the European methods of woodwork, with the result that imported sawn timber was used for making canoes. The craftsmen were no doubt influenced by the scarcity of timber in their own islands. The use of sawn planks influenced shape and technique, and the information obtained about the original types of canoes is scanty and inadequate. Missionary influence led to abandonment of the annual migrations between Manihiki and Rakahanga,

and the old-time double canoes in which the voyages were made disappeared early as a consequence. Many models, however, of double canoes were made by the old men for sale or to give as presents, and some general idea of the shape of the hull and some of the technical details may be obtained from them.

The canoe hulls were made of *tou* and *whano,* the largest trees that grow locally. The *tamanu,* so much used in Cook Islands, did not grow on the two atolls. The outrigger booms were made of *whano,* the float of *tou,* and the connecting pegs between them were provided by the tough *ngangie* shrub. Although it is generally held that coconut wood is unsuitable for canoes, a small dugout hull of this wood was observed on Rakahanga. Sennit braid was used for the lashings and coconut husk for the calking. The bark of the *ngahiu* shrub, which fringes the shores of the islands, was used for plugging the lashing holes.

Terms and Technique

The general term for canoe is *waka.* The hull is the *tino waka* (*tino,* body); the hold is the *ri,* a contraction of the general Polynesian term *riu*; and the outer under part of the canoe that corresponds to the keel is the *takere.* The bow is the *ihu* and the stern, *velo,* but in the built-up canoes the terms *ihu* and *velo* include the complete bow and stern pieces which are separately attached to the hull. The separate top side or gunwale to raise the depth of the canoe is the *awa.* Seats (*nohoanga*) were lashed to the top edges of the hull, and curved wooden braces (*manu*) were attached to the gunwales on either side. It was stated that the braces were attached just behind the seats so that the curved horizontal parts served as back rests. Two straight outrigger booms (*kiato*) were used and were attached indirectly to the float (*ama*) by four straight pegs (*tiatia*).

The process of hollowing out the hull was *haro,* or *hauhau.* A join was *pahu,* the fitting of the two pieces together, *tuita,* and the lashing of the join, *wharo.* The lashing of booms and pegs was distinguished as *whawhau.* Pieces were joined together by boring holes near the edge right through the piece and making them in opposite pairs on the two pieces. Before lashing, the husk calking was laid on the upper edge of the lower piece and narrow battens were laid along on both sides to cover the seams. It was stated that the batten on the inside of the hull was composed of split pieces of aërial hala roots (*kawhara*), and that the outer batten consisted of strips of turtle shell (*una honu*). The width of the battens was adjusted to the space between the paired holes. The lashing with sennit braid was continuous, the braid, after making the requisite number of turns through the pair of holes and around the seam battens, being carried on to the next pair of holes. The carrying forward was always on the inside of the hull and was oblique

to the hole on the other piece of timber. In plugging the lashing holes, the *ngahiu* bark was warmed at the fire and scraped into fine pieces with a *kahi* shell. The material was then plugged (*momono* or *mono*) into the holes with an implement made of pearl shell tied to a handle. By means of the handle, the material could be well pushed in and hammered. No forked wooden implement was used as in Cook Islands in tightening the lashings.

Types

Introduction

Three types of old-time canoes were made, the one-piece dugout, the five-piece larger canoe, and the double sailing canoe. A fourth type is the modern plank canoe. The double sailing canoe survives in the form of numerous models in museums. These models were made by old men for sale, and the stern pieces, bow pieces, and gunwales are richly inlaid with pearl shell. The tendency in making models is to exaggerate the size of the decorative parts. In New Zealand model war canoes, most carved bow pieces and tail pieces are exaggerated out of proportion to the size of the hull in order that the craftsman may have enough space upon which to display the carving. Similarly, it appears to me that the bow and stern pieces in the model double canoes of Manihiki have been exaggerated in depth in order that the craftsman may have space for more rows of pearl shell inlay and thus, to his mind, improve the selling qualities of the model. Unfortunately, the canoe modelers have died and I was unable to get a demonstration of the actual model. Under the circumstances, it can only be surmised that the models have followed the old-time sailing canoes in general principles but that the proportions of the parts and some details have departed from the original working technique.

Figure 58. Dugout canoe hull made of section of coconut trunk. (Drawn from a photograph.)

One-piece dugout canoe

The one-piece dugout (*puni*) was evidently not considered worthy of being called *waka*, a term used to specify the five-piece canoe. The hull was hollowed out of a single section of tree trunk, with the bow pointed and the stern blunt. (See fig. 58.) The coconut wood hull seen at Raka-

hanga complied with the *puni* type. Such canoes, fitted with outriggers, were used within the calm waters of the lagoon for fishing, obtaining *Tridacna*, and transport between the islands of the same atoll.

FIVE-PIECE CANOE

The five-piece canoe (*waka*) was evidently built on the same lines as the individual hulls of the double sailing canoes. From the meager accounts of native informants, the *waka* do not seem to have been made of so many pieces as the canoes of Tongareva. It was stated that they were restricted to five pieces, the hull, bow, and stern pieces, and a gunwale on either side. Some general idea of the *waka* may be formed from the discussion of the double sailing canoe models.

DOUBLE SAILING CANOE

The double sailing canoe (*waka taurua*) is described from the model canoe in plate 7, *C*, which is typical of the models produced. (See figs. 59-68.)

The two canoes are of equal size, and a striking characteristic is the setting of the two bows in opposite directions to avoid bringing the canoe around in tacking. Each canoe consists of five pieces, as in the *waka*, but in addition, bulwarks (*paruru*) of lauhala were added above the true gunwales to raise the level to the height of the deep bow and stern pieces.

The hull (*tino waka*) was formed of solid timber, dubbed out to form the bottom of the hold, square at the stern, pointed at the bow, and with an angular projection on the under part toward the bow. The general shape is shown in figure 59.

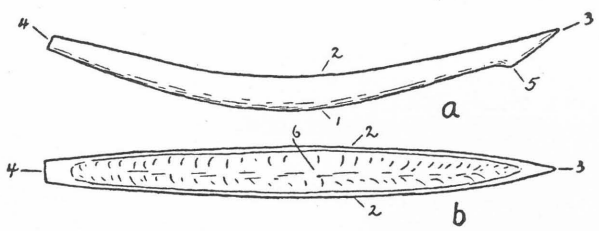


FIGURE 59. Double canoe, hull: *a*, right side; *b*, top view. 1, long convex curve on under side, brought to sharp edge in middle line to form the *takere;* 2, thin upper edges dubbed out to form long concave curve; 3, sharp, pointed bow piece; 4, stern, cut down at approximately right angles with upper edge; 5, angular projection under bow; 6, hold (*ri*).

The stern piece (*velo*) is a solid aft projection with the wider fore end hollowed out to fit over the hull below and junction with the gunwale and *paruru* wall in front. The stern end projects backward beyond the hull and ends in a slightly raised part ornamented by four knobs. The forward upper end widens out into a triangular seat with a raised square knob on each side of its forward base. (See fig. 60.)

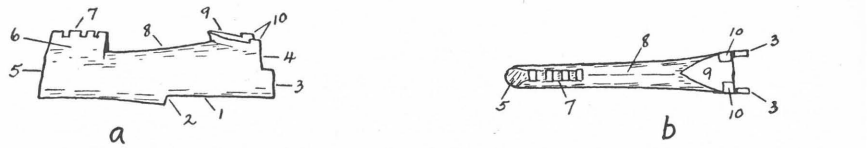


FIGURE 60. Double canoe, stern piece: *a*, right side; *b*, top view. 1, section which fits over hull; 2 shoulder, base fits against stern end of hull; 3, forward projection, fits against aft end of gunwale; 4, section which fits against lauhala bulwark (*paruru*); 5, square-cut stern end, somewhat oblique downward and backward; 6, upward stern projection cut with three square gaps on upper edge; 7, knobs formed by cutting away of gaps; 8, sharp upper edge; 9, raised triangular seat cut out of the solid; 10, two square knobs at base of seat.

The bow piece (*ihu*) is wider aft to fit over the hull and has two back projections to fit against the gunwales. (See fig. 61.) The gunwale projections are of the same depth as the gunwales, and above them the lauhala bulwark fits against the remaining part of the aft end of the piece. Above, a four-sided seat is provided out of the solid with two square knobs at its aft angles. Forward, the solid piece comes to a pointed bow.

FIGURE 61. Double canoe, bow piece: *a*, right side; *b*, top view. 1, section which fits over keel; 2, sloping, narrowed forward end; 3, pointed bow end; 4, gunwale projections cleared by hollowing of aft part; 5, sections which fit against bulwark; 6, four-sided seat, level with top edge, sides appear raised owing to downward slope of sides of bow piece; 7, squared knobs at angles of wider aft end of seat; 8, sides, slope to mesial edge which meets sharp point of bow.

The gunwale (*awa*) is a plank, convex below to fit against the upper edge of the hull and with a corresponding concave upper edge which supports the bulwark. (See fig. 62.) The plank fills the space between the gunwale projections of the stern and bow pieces, and its ends are cut to fit them. On the inner side, a raised flange is formed near the lower edge through which holes are bored for the lashings with the hull.

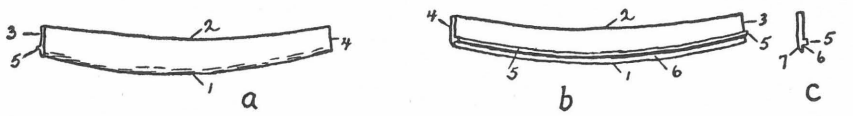


FIGURE 62. Double canoe, gunwale plank: *a*, right outer side; *b*, right inner side; c, cross-section. 1, lower convex edge; 2, upper concave edge; 3, aft end to fit against stern piece; 4, fore end to fit against bow piece; 5, internal flange, holes drilled vertically through base of flange at intervals to correspond with holes bored horizontally through hull a little below upper edge; 6, space below flange, rests against outer side of hull; 7, lower edge, rounded on outside.

The bow and stern pieces are fitted to the hull, and the intermediate gunwale fills in the space as shown in figure 63. The figure shows the relative positions of the five

pieces in a double canoe model. It is obvious that, owing to the depth of the stern and bow pieces, another element is needed which in the model is supplied by the lauhala bulwark. If the single canoe of the *waka* type consisted of only five pieces, it is obvious that the gunwale would have to be much deeper or the stern and bow pieces much

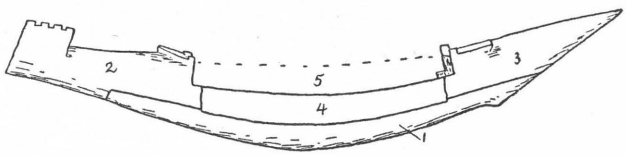


FIGURE 63. Double canoe, hull elements assembled: 1, hull (*tino waka*); 2, stern piece (*velo*); 3, bow piece (*ihu*); 4, gunwale (*awa*); 5, space to be occupied by lauhala bulwark (*paruru*).

lower. For ordinary fishing purposes outside the reef, it is probable that the stern and bow pieces were much lower and that the canoe would then more nearly assume the appearance of the Tongarevan canoe (29, p. 189). The joins (*pahu*) between the pieces are lashed (*wharo*) as stated with through and through lashings, the seams being covered both on the inner and outer side by narrow battens. The lashing turns are thus seen on both the inside and the outside. An exception exists in the lashing of the gunwale to the hull, where, owing to the gunwale flange, a different technique is introduced. (See fig. 64.)

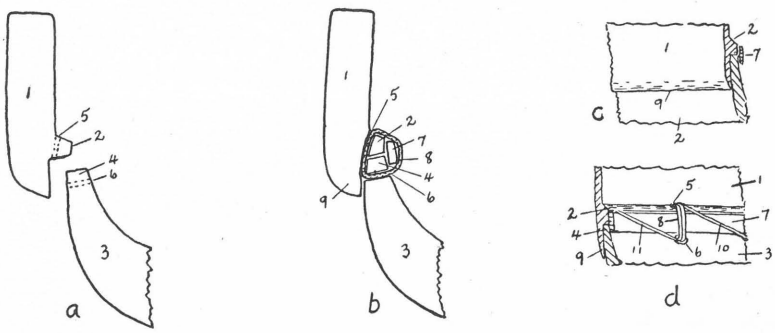


FIGURE 64. Double canoe, gunwale and hull lashing: *a*, sections of gunwale and hull ready to be fitted together; *b*, sections fitted and lashed; *c*, outside view; *d*, inside view. 1, gunwale; 2, inner flange; 3, hull; 4, upper edge of hull; 5, spaced flange hole; 6, spaced hull hole; 7, inside batten over seam, width slightly less than distance from upper edge of flange and hull hole; 8, lashing braid, passes inward down through flange hole and through hull hole from without, after two or more turns are made, goes diagonally upward on inside to next flange hole, when lashing turns made with that pair of holes—though lashing turns through gunwale flange hole confined to inner side, turns appear on outer side of hull, but, owing to downward projection of lower edge of gunwale, are concealed from outside; 9, lower edge of gunwale, overlaps and conceals lashings from outside; 10, braid ascending to flange hole to make two lashing turns (*d*, 8); 11, braid passing on to flange hole of next pair.

The use of a raised flange in lashing canoes raises the inquiry as to whether it was used in the full-sized canoes. The projecting lower edge of the gunwale renders it awkward to thread the braid through from the outside of the hull edge. In the models, all the paired holes must have been threaded first by everting the lower edge of the

gunwale. After the two pieces had been fitted closely together, the lashings could be tightened out progressively from one end. In a full-sized canoe this technique seems too awkward to be of practical use. If the lower projecting edge of the gunwale were cut off below the flange and a similar flange made on the inner side of the upper hull edge, the Samoan double flange joins (28, p. 387, fig. 230) would have been arrived at; but the lashing technique still remains different. On the whole, the Manihiki flange does not seem to have been influenced by diffusion from the west, but to have been formed to widen the hull by overlapping with a thick gunwale piece.

The cross booms (*kiato*) in the larger models are three, but in the full-sized canoes it was said that there were several. They served the double purpose of lashing the two canoes together and of providing joists upon which a platform was made in the space between the two canoes. In the models the end booms rest on the upper edges of the gunwale projections of the bow and stern pieces. Thus the boom on one canoe rests on the two projections of the stern piece and on the other canoe on the two projections of the bow piece; the positions are reversed at the other send. The middle boom rests on the middle of the upper edge of both gunwales of both canoes. This position of the end booms on the gunwale projections of the bow end stern pieces is sound, as some of the strain is taken off the intermediate gunwale. In some models, however, all three booms are attached to the gunwale. The booms are rounded spars with their ends cut off flush with the outer sides of the two canoes.

Each boom is lashed to the four edges on which it rests. Each lashing is made through two holes bored a little below each edge. The holes are spaced to the diameter of the boom. The lashing turns cross the boom transversely on either side of the canoe piece edge after passing through the holes, diagonal turns are crossed over the boom to form a simple lozenge pattern, and finally circumferential turns are made horizontally around the lashing between the boom and the piece edge. The lashing differs in no particular from the Samoan technique described by Hiroa (28, p. 394, fig. 239, *a-f*).

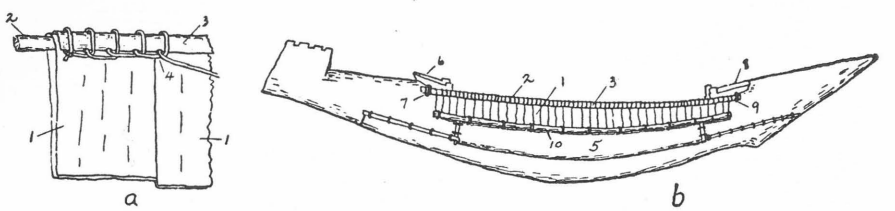


FIGURE 65. Double canoe, bulwark (*paruru*): *a*, bulwark; *b*, fitting of bulwark to stern, gunwale, and bow pieces. *a*, strips of lauhala (1) doubled over round spar (2) and piece of dyed *papa* material (3) stitched along top to fold over for depth of spar; doubled-over parts stitched to spar by series of half-hitches (4) made with two-ply twisted sennit (*whauhoto*). *b*, bulwark placed above gunwale (5) and spar (2) stretched between stern and bow pieces; aft end of spar fitted just below aft seat (6) and secured with lashing (7) passing through holes in stern piece; fore end fitted just below fore seat (8) and secured with lashing (9) passing through holes in bow piece; lower spar (10), wrapped also with *papa* material dyed red, laid over lower ends of lauhala and jams them against sides of gunwale and gunwale projections; lower spar secured by series of turns passing around spar and through holes in upper edges of woodwork in much the same way as seam batten, but lashing turns more widely spaced; any extra length of lauhala cut off below lower spar.

The bulwarks (*paruru*) in the models are made of sections of lauhala doubled over a long spar stretching between the bow and stern pieces and slightly overlapping them at about the level of the two seats. For decorative purposes a strip of *papa* material

(see p. 134), dyed red, is folded over the top and the *papa* and lauhala are stitched to the upper spar with continuous half-hitches. The leaf sections are sufficiently long to overlap the upper edges of the gunwale and gunwale projections of the bow and stern pieces, to which they are fixed by a long batten laid over them and lashed at intervals to the upper edges of the gunwale and gunwale projections. (See figure 65.) The bulwarks fill in the space above the gunwale quite effectively. Compare figure 65 with figure 63. In the full-sized canoes, it was stated, the bulwarks were about 2 feet high. I am not sure whether or not lauhala was used. It seems quite probable, however, that the canoe with the wooden hull and gunwales was quite deep enough and that lauhala may have been used for protection against wind and spray as an alternative to timber, which was not plentiful.

Cross braces (*manu*) were used to give additional support to the gunwales and bulwarks. These consisted of two vertical limbs with an arched connection cut out of one piece of timber. The structure and methods of lashing to the top of the gunwales and the inner sides of the bulwarks are shown in figure 66.

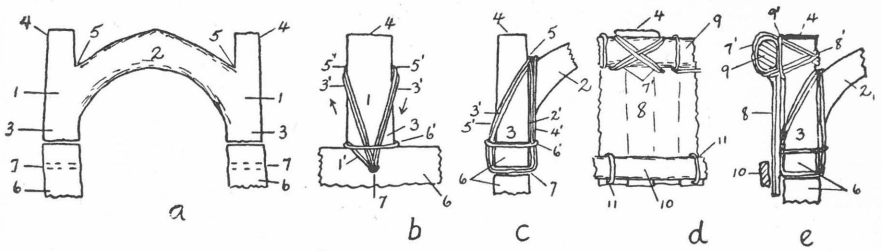


FIGURE 66. Double canoe, cross brace (*manu*) and lashings: *a*, brace; *b-e*, lashings. *a*, brace, fore or aft view: 1, vertical brace limbs, rectangular in cross-section, feet slightly thicker than heels but width equal throughout (see *b*); 2, arch, four edges may be slightly rounded and upper surfaces may meet in mesial transverse edge above; 3, limb feet, same thickness as gunwales on which they rest; 4, upper projecting heels; 5, acute heel angle; 6, gunwales; 7, holes bored through gunwales below middle of limb feet. *b*, lashing, outer side: foot of brace rests on gunwale with hole below middle of foot; brace lashed to gunwale on either side by turns passing through gunwale hole and around heel angle; end of braid passed through hole (7), slip knot made around standing part, and loop (1′) drawn taut on left with knot to inner side at back of foot; loop (*c*, 2′) made on inside over heel angle, braid brought down and pushed through hole from inside; from outside, loop (3′) made over heel angle at back and braid brought down and pushed through hole from outside; second loop (*c*, 4′) made over heel angle from inside and braid pushed out through hole; from outside, second loop (5′) made over heel angle and braid pushed through hole from outside; transverse turn (6′) made around lashings at base of foot and end tied with overhand knot to one limb of loop on back. *c*, view from behind: inside loops (2′, 4′) and outside loops (3′, 5′) pass over heel angle (5) above and through gunwale hole (7) below; circumferential transverse loop (6′) passes around base of foot (3); lashing secures brace to gunwale. *d*, outside view with bulwark in position, braces likely lashed to gunwales before bulwark (8) added; upper spar (9) of bulwark lashed to heel (4) of brace by diagonal turns (7′) which cross on outside and are pushed through lauhala below spar; lower batten (10) belongs to technique of fixing lower ends of bulwark; turns (11) belong to technique of bulwark. *e*, view from behind with section through bulwark (8), upper spar (9), lower bulwark batten (10), and gunwale (6): lashing turns from front (7′) pass behind heel (4) where they form loops (8′), each succeeding loop from above or below spar (9) crossing arch of preceding one to prevent their slipping up on back of heel.

In the model double canoes the lower ends of the braces are lashed to the top edge of the gunwales and the full depth of the vertical limbs rests against the inner sides of the bulwarks. Braces were also used in the single *waka* canoes, and it was stated that the vertical limbs rested against the inner side of the gunwales. Supporting this were the further statements that the curve of the brace formed a back rest for the seats which rested on the upper edge of the hull. If this is correct, it is probable that extra wide flanges were left at appropriate places on the inner side of the upper edge of the hull to support the seats and the feet of the cross braces. If the seats were lashed to the top edges of the gunwales, the feet of the cross braces could still be lashed to the inner side of the gunwales and leave enough of the arch projecting above the gunwale to furnish a back rest. In the Tongarevan canoe pictured by Choris (29, p. 189) braces similar to the Manihiki *manu* are shown with the arches well above the level of the gunwales. The Hawaiians use a brace, but with the convexity downward. The Maoris used straight thwarts as both seat and gunwale brace, and the Manihikian term, *manu,* for a cross brace is represented by the Maori term, *taumanu.*

The platform (*horiki*) in the models is made of a single piece of timber cut to fit the space between the canoes and resting on the cross booms (*kiato*). In the full-sized canoes, the platform probably consisted of a series of planks or poles lashed to the cross booms.

Horizontal spars (*tautara*) were laid transversely over the bulwarks and lashed to the top spar on each side. In the large models there is one close to the bow piece, another close to the stern piece, and two evenly spaced between. The spars are even with the bulwarks on the platform side but project well out on the other side. They were used for the stays supporting the masts. In a single canoe made on the same model as the double canoe, the spars projected equally on both sides.

The Manihiki mast somewhat resembles the Samoan mast with the expanded top end shaped like a netting needle and open at the top. The curve of the expanded portion, however, more nearly approaches a circle. The lower end of the mast has a curved notch. (See fig. 67.)

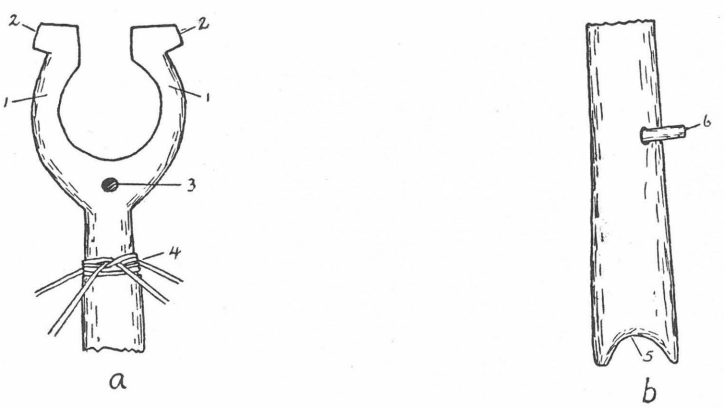


FIGURE 67. Double canoe, mast: *a,* upper end; *b,* lower end. 1, curved limbs; 2, outer knobs; 3, hole bored through below upper circular opening; 4, four stays tied around neck; 5, curved notch at lower end; 6, wooden peg for support of sail rope (halyard).

The sail is made of lauhala plaited in check and is triangular in shape with the base turned upward. The two sides are lashed to spars at intervals, the shorter straight side to a thicker spar (yard) which lies fairly vertically against the mast, and the longer side, somewhat curved, to a long flexible spar (boom) which follows the

curve of the edge. The free upper base is ornamented with a fringe of dyed *tou* bast. If the model sails are true to type, the Manihiki sail is intermediate between the Maori and Hawaiian sails. The Maori type, as represented by an old sail in British Museum (25, p. 353, pl. 40), is narrower at the base, which is ornamented with tufts of feathers. Both sides had loops, one side for the mast and the other for a sprit. A Hawaiian sail in a Paris museum, as observed from a photograph in the possession of Mr. Houston of Honolulu, is wider than the Manihiki sail at the base, which is unornamented. One side of the sail is lashed to the mast and the other side has a greater curved sprit than the Manihiki sail. In all three, the principle of keeping the apex down at the foot of the mast is similar. In the Samoan triangular sail the apex is carried forward, which sets the sail obliquely instead of vertically.

In all the models the lower end of the mast had a curved notch, evidently for fitting over some transverse support, but it was not always clear what the support was. In some canoes, the notch fitted over the cross boom connecting the two canoes, and in others they were simply stuck against the gunwale. The mast was kept in position by four side stays (shrouds) which were tied at the upper ends to the mast a little below the upper expansion; the lower ends were tied to the outer ends of four horizontal spars (*tautara*). The length of the stays indicates that the masts were set up in one of the canoes and not on the platform between the canoes.

The sail (fig. 68) had a rope (halyard) tied to the straight spar at about the junction of the upper and middle thirds. In the models, the rope was run through the hole in the mast below the upper expansion. The sail was hauled up so that the shorter spar became vertical with the tie at the level of the mast hole, and the lower end of the rope was tied either to a wooden peg let into the mast or to an adjacent horizontal spar. A rope (sheet) was also tied to the curved spar at about a quarter of its length from the upper end, and the lower end was tied to a horizontal spar to the set required.

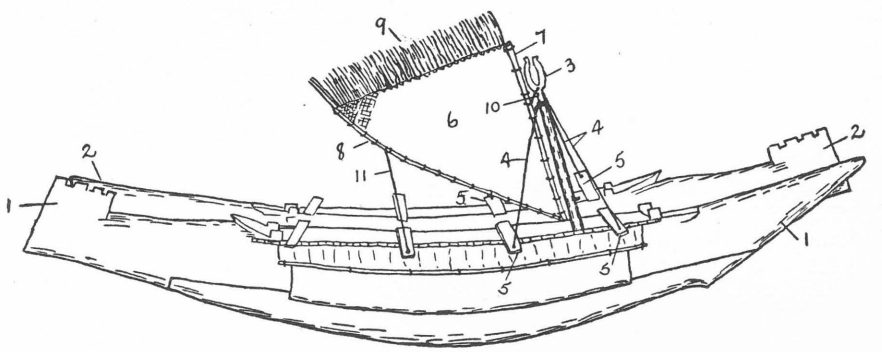


FIGURE 68. Double canoe, setting of mast and sail: the two canoes (1, 2) joined with bows in opposite directions; mast (3) stepped on inner gunwale of near canoe (1) and stayed by four ropes (4) tied to outer ends of four transverse booms (5); sail (6) with shorter straight spar (7), longer curved spar (8), and fringe (9) at base drawn up with halyard rope (10) passing through small hole in mast in model but probably through larger upper opening in full-sized canoe; sheet rope (11) tied to longer spar (8) and to end of one of horizontal spars.

Pearl shell inlay was used on the bow and stern pieces and on the arches, in the large canoes, of the cross braces that formed back rests for the seats. In the models, the gunwale, wooden platform, and horizontal spars (*tautara*) were also inlaid. The pearl shell pieces (*tiwha*) were cut in circles, triangles, squares, and lozenges, with one shorter than the other, and in pentagons. The process of inlaying (*tatai*) took the form of horizontal rows of circles or pentagons on the stern and bow pieces, single

rows of large squares or rectangles on either side of the wooden platform, and single or double rows of triangles on the gunwale. On the gunwale the triangles in a single row had the bases alternating so that the wood between showed as a zigzag space; in the double rows the bases were continuous and opposed in the two rows so that the apices of opposite triangles met and formed a row of lozenge-shaped wooden spaces between the two rows. The pearl shell pieces were set in level with the surface of the wood. The lozenge-shaped pieces were each pierced with a pair of holes and threaded on a cord along the horizontal junction of stern and bow pieces with the hull, the cord, in the models, having been laid on the outer seam batten and included with it under the lashings of the join. Circular pieces were also threaded to terminate the ends of the rows of lozenges. (See pl. 7, *C*.) Pearl shell inlay is characteristic of Manihiki and Rakahanga. Brigham (3, p. 97) made a curious mistake in attributing the canoe models of Manihiki to Manihi of the Paumotu (Tuamotu) Archipelago. In describing Manihi, he stated, "Inhabitants make curiously elaborate canoes." The inlaid double canoes in Bernice P. Bishop Museum labeled by him "Manihi, Paumotu" are without the slightest doubt from Manihiki.

The *waka taurua* was used for transport in the annual migrations between the two atolls.

MODERN PLANK CANOES

The modern canoes (pl. 7, *A, B*) are made of imported sawn planks. The planks forming the sides are bent around and nailed to slanting bow and stern posts so that the canoe is pointed fore and aft. The bottom is formed of transverse pieces of board nailed on and is thus flat. A low gunwale is added on either side, and a portion of the bow and stern is covered over with pieces of plank nailed to the gunwales. Two straight outrigger booms are used which are indirectly connected with the float by two pieces of board driven into the float and lashed to the booms. (See figure 69.)

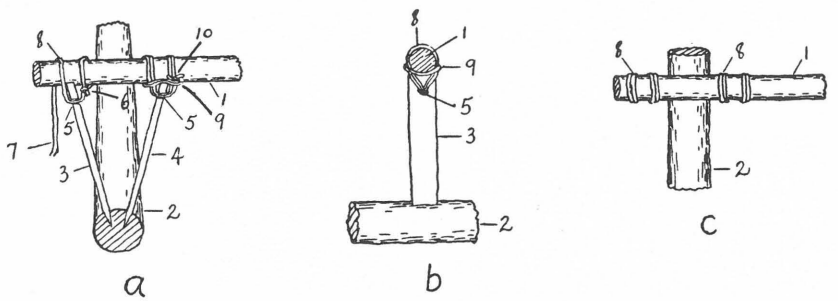


FIGURE 69. Modern canoe, indirect connections between boom and float: *a*, aft view; *b*, view from outboard; *c*, top view. Outrigger boom (1) attached to float (2) by outer connecting stave (3) and inner connecting stave (4); stave width same as boom diamater, upper ends slightly concave to accommodate round boom, lower ends sharpened to longitudinal edge driven into boom in slanting position; hole (5) in middle line a little below upper edge of staves; slip noose (6) passed around boom, sennit (7) passed through stave hole to form loop (8) over boom; sennit passed back through hole to make second loop over boom on inner side of stave and then repeated on outer side; one or two circumferential turns (9) made transversely around vertical lashing turns between stave and boom, end tied to set of vertical turns with overhand knot; sennit braid carried across to second stave and lashing of two inner and outer turns around boom with two circumferential turns repeated.

Paddles

Paddles (*hoe*) are made of coconut wood and are characterized by long narrow blades which end in fairly sharp points.

An average length is about 65 inches, of which the blade takes up 31 inches or slightly less than half the total length. Some paddles have shorter blades with correspondingly longer handles.

The handle is round in section, cut off square at the top, and of fairly even diameter (about 1.2 inches) throughout its length. Approaching the blade, it flattens out slightly on the front so as to merge with the anterior front surface of the thin blade. This causes the handle to project on the back of the blade, down the middle line of which it extends as a raised rib gradually diminishing in width and depth until it ends 6 inches to 7.5 inches from the upper edge of the blade. In the typical paddle the rib is transversely convex, but in some inlaid paddles it is quadrangular in section to provide a flat surface upon which pearl shell discs are inlaid. (See pl. 8, *A*.)

The blade is ovate, the broad end junctioning with the handle. In most paddles, the blade forms a clean-cut obtuse angle with the handle, but in a few the blade slopes gradually upward to the handle without any sharp angle. The average width at the widest part is slightly more than 5 inches, but some may be less. In all blades the nearness of the greatest width to the handle junction is characteristic. From the greatest width the sides of the blade slope evenly down to the point, which is thus long and narrow.

The front of the blade is slightly concave longitudinally and slightly convex transversely, though some appear fairly flat. The back, marked by the handle rib in its upper part, is slightly convex longitudinally and flat or slightly convex transversely. The thickness is greatest in the middle line, whence it thins out toward the side edges. The blade thins off generally at the lower end but the actual point is reinforced on the back by thickening it to form a back projection extending upward for from 0.5 inch to 1.3 inches in the middle line.

Some paddles are inlaid with round or triangular pieces of pearl shell set on the front of the blade near the handle junction and may extend to the lower part of the handle itself. Inlay may also be applied to the handle rib on the back. (See pl. 8, *A*.)

A paddle in Bernice P. Bishop Museum (C. 523) wrongly attributed to Manihiki by its donor is described in the legend of plate 8, *A*, 5.

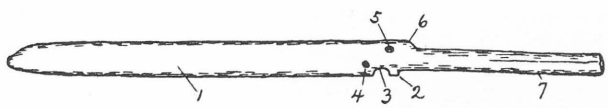


FIGURE 70. Steering paddle used with double canoe: 1, blade, long, fairly narrow, thick, with rounded edges; 2, shoulder on under side; 3, curved notch to fit over horizontal transverse spar; 4, 5, holes to take rope which lashes steering paddle to transverse spar; 6, upper shoulder; 7, handle, rounded in section; length of paddle, 13 or 14 feet. (Drawn from photograph.)

Steering paddle used with double canoes (fig. 70):

This paddle was shaped more like an oar than a paddle. The model paddle has a long somewhat narrow blade with a blunt end, a curved notch near the blade shoulder on one side and a hole through the opposite shoulder to carry a short rope. The notch was rested on a horizontal spar across the stern, and the rope was tied in a loop around the spar to secure the paddle and allow movement in steering. In some model

canoes supporting spars were attached to both canoes at each end. The steering paddle was lashed to the middle of the aft spar and the handle manipulated from the rear of the platform between the canoes. In other models the spar was attached across the stern of each individual canoe and projected on the outward side to give support to the steering paddle. The double canoe was then steered from the stern of the canoe which was bow on. A full-sized steering paddle, said to have been used in the double canoe voyages between the atolls, was preserved in Rakahanga. The old men insisted that it was the original type and not modeled on a European steer oar. The model steering paddles have followed its shape.

Bailers

Coconut shells are used for bailers (*tata*) for the small canoes, but wooden bailers are made for the larger canoes on the Polynesian principle of a scoop with a mesial handle projecting forward from the upper edge of the raised back. The scoop figured in plate 7, *D* has a flat bottom with fairly vertical sides meeting the wide bottom at an approximately right angle. This departure from the rounded bottom has probably been influenced by the use of the modern flat-bottomed canoes, large ones necessitating the use of such flat bailers for loading and unloading trading schooners.

FISHING

Introduction

Fish, the staple article of flesh food, is plentiful in the inner and outer lagoons and the deep sea beyond the reef. Though no permanent deep channels connect the sea with the inner lagoon, shallow channels exist between the islands, and through these the sea flows in and out with the tides. Shoals of fish enter the lagoon by these channels with the incoming tide and retire with the ebb. Fishing with hand nets was done in lagoons and in the passages during the incoming tide. A favorite time for fishing was at night, when torches of dry coconut leaves were used.

Torches made by bundling whole leaves together in the same manner as in Cook Islands were used in the outer lagoon, some men carrying the torches while others used the scoop nets. A party generally worked along the lagoon in line so as to prevent the escape of fish. Torches were also used on canoes in the inner lagoon and out at sea when netting flying fish.

In the outer lagoon spears were used as well as nets. Nowadays, a piece of hoop iron is often used while torching. The fish, attracted by the light, swim very near the surface and are readily killed with a blow of the hoop iron. In olden days, a piece of wood was used.

Crayfish are caught in a strange manner by torching at night. The crayfish may be seen moving about on the bottom. The fisherman wades toward it and quickly puts his foot on it to hold it down on the reef. He

then grasps it in his hand and deposits it in a basket carried around the waist for the purpose.

In all these methods, quick judgment and allowances for the rate and direction of movement of fish are required. Constant practice has made the native fisherman expert with net and spear.

The spears in use are iron-pointed, and no data were offered regarding old types. Self-acting traps were not made, but walled traps were used on both atolls. The fishing craft concerned itself mainly with nets and angling.

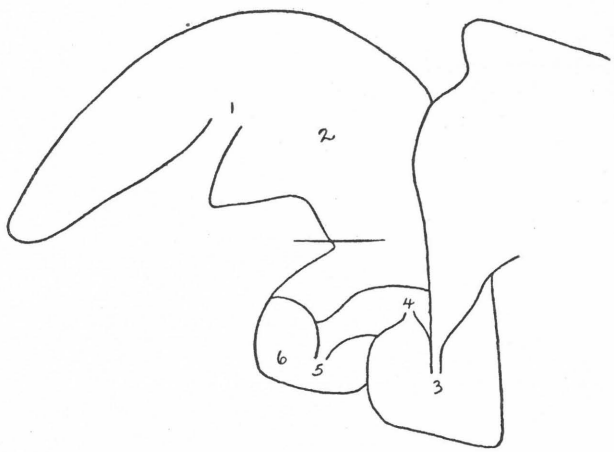


FIGURE 71. Walled fish trap near Tukou: 1, entrance; 2, large inclosure, converging walls render it difficult for fish to find exit; 3, 4, 5, openings of maze-like chambers; 6, inner chamber, exceedingly difficult for fish to find exit.

WALLED TRAPS

The walled fish traps were made of coral rocks piled up loosely to form walls that emerged above high water. A trap was seen at Rakahanga in the outer lagoon off the island of Te Kainga. The curved walls converged to narrow openings which projected into inner chambers of the maze-like structure. The principle of the trap was derived from the tendency of the fish, in trying to escape, to keep along the walls and to miss the inward-projecting openings. Unfortunately, no time was available to plot out the plan of the Rakahangan trap. Phillip Woonton made a rough sketch of the trap near Tukou in Manihiki which illustrates the general principle of the walled traps (fig. 71). The traps were made in conjunction with channels frequented by fish, and the shape was influenced in some details by the lie of the channels and the depth of the water.

Nets

Nets (*kupanga;* Cook Islands and New Zealand, *kupenga*) were made of sennit two-ply twisted cord (*whauhoto*), which has been displaced in recent times by foreign cord. The nets are all bag nets. Long seine nets are not used. A mesh is *komata* or simply *mata*, and commencement meshes are *na mata i te aro*. A needle (*hika*) (fig. 72; pl. 8, *C*) and a mesh gage (*haeha*) are used in netting. Netting technique is as follows:

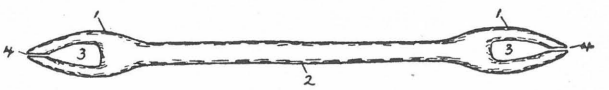


FIGURE 72. Wooden netting needle (*hika*) 11.2 inches long and 0.3 inch to 0.35 inch thick throughout: 1, ends, greatest width, 1 inch; 2, middle, width, 0.4 inch; 3, eye, 1.1 inches long, greatest width, 0.4 inch; 4, open end slit of eye.

A supporting cord, on which a row of meshes (*ara pona: ara,* path; *pona,* knot) is set up for the length of the net circumference, is used. The supporting cord is knotted at its ends to form a wide loop, which the net-maker hooks over one of his toes. An assistant holds the free end of the netting cord for the first row while the principal uses the netting needle and mesh gage as in figure 73. On completing the first row, the second row is added as in figure 74. To shape the net, extra meshes (*mata i te tua*) are put in as in figure 75. This technique of adding extra meshes has been described for New Zealand (26, p. 609) and Samoa (28, p. 472). As each row is completed the net is turned, and successive rows are added in the manner in which the second is added to the commencement row. When the net is of sufficient depth, the two ends are brought together and joined with the netting knot by crossing the cord alternately from side to side through the loops of the marginal meshes. The bottom is closed in the same way.

Four types of nets and methods of using them are as follows:

1. The flying fish net (*kupanga maroro*) consists of a long handle (*huata*), a frame (*kaututu*), a crossbar (*teka*) to keep the frame expanded, and the bag net attached to the frame and the crossbar. (See fig. 76; pl. 8, *B*.) The net has a circumferential cord through the marginal meshes of the opening. The cord is lashed at intervals to the frame and crossbar. The net is used at night with coconut-leaf torches from canoes outside the reef. The wielder of the net stands in the bow while a torch-bearer holds the light behind him and others paddle the canoe. In individual torching (*turama maroro: rama,* torch; *tu,* active verbal prefix; *maroro,* flying fish) each canoe crew seeks the fish without cooperating with the other crews. In cooperative torching (*tanga maroro*) a fleet of canoes acts together. Each canoe has a number of torches, and canoes of the fleet line up in single file. The leading canoe has the best chance and the rear canoe the worst, so each canoe gets its turn in front during the burning of one torch. When the first torch burns out, all the canoes put out their torches. The rear canoe (*hakaporo* or *poro*) paddles quickly up to the head of the file and when in position gives the command, "Tungina!" (Light up!) —*na te poro e hakakite mai te tutu* (the rear canoe announces the lighting). With each new torch the rear canoe moves up to the head. The methods of wielding the net vary with the position of the fish. The flying fish are usually near the surface of the water, and as they commence their flight two motions are required to secure them. First the net is brought down flat over the fish (*whakahei*) to prevent its escape by flight, and then a quick upward turn (*tirapa*) scoops the fish into the bag of the net. When fish are plentiful the *whakaepa* stroke is used, which consists of a lateral sweep along the

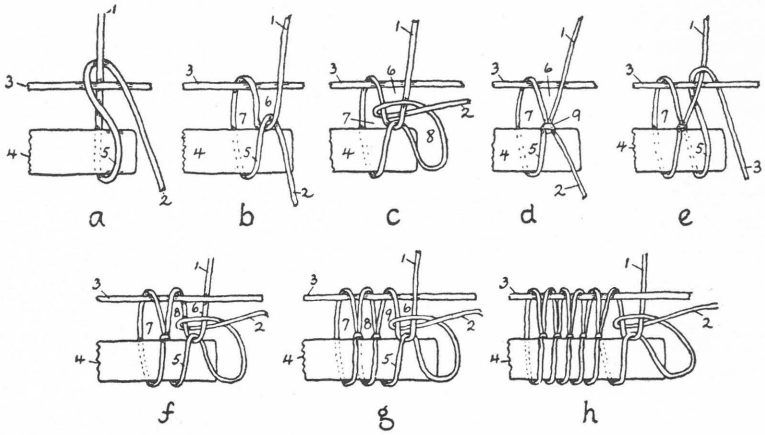


FIGURE 73. Netting technique (*ta kupanga*), first row. *a,* assistant holds length of slack judged sufficient to form upper halves of all meshes of first row; with slack in hand, he draws cord (1) taut under supporting cord (3) while principal netter, holding other end taut with needle, places appropriate gage (4) over cord; he spaces gage with left hand so that gage is same distance from supporting cord as its own depth; he turns netting cord up over lower edge of gage to form lower half of mesh (5) and keeps it in position on gage with left thumb; he then takes needle end of cord (2) over supporting cord, passes it under short end (1) from left to right and brings it back over supporting cord. *b,* netting end (2) drawn taut and assistant slacks off short end until it is brought down to upper edge of mesh gage in loop (6) which incidentally defines first mesh (7). *c,* netter places left thumb over crossing of loops and by pressing it against mesh gage prevents loop of mesh (7) from altering in size; he flicks netting cord to right to form large loop (8), takes needle across both limbs of upper loop (6) from right to left, brings needle back to right under both limbs of upper loop up through large left loop (8). *d,* netting needle drawn taut and netting knot (9) results in completion of first mesh (7); principle of forming individual meshes can now be followed; upper half of meshes formed by short length (1) held by assistant, its upper end defined by turn around supporting cord; lower half formed by cord attached to needle (2) and lower end defined by turn around lower edge of mesh gage; the two cords crossed in loops on upper edge of gage and fixed with netting knot. *e,* to form next mesh, netting cord turned to back of gage to follow procedure adopted with first mesh and brought up around lower edge of gage to form lower loop (5) which is held against gage with left thumb; short length (1) must now be brought down to upper edge of gage to form upper half of mesh; as, however, short length (1) now in front of supporting cord (3), needle must be passed under supporting cord and hooked over short length from left to right in order to loop short length over supporting cord. *f,* short length (1) drawn in loop (6) to meet upper edge of gage to define second mesh (8), crossing fixed with left thumb and netting knot made as in *c;* both limbs of upper loop (6) now under supporting cord (3). *g,* needle, after adjusting lower loop (5), passes above supporting cord as in *a* to bring upper loop (6) down to mesh gage and insure that upper half of mesh (9) looped around supporting cord (3); knot made. *h,* meshes as made, pushed to left on gage; netting needle passes alternately above (*a*) and below (*e*) supporting cord to hook down short length to form upper halves of meshes; after each knot, netting cord turned to back of gage and brought up under its lower edge to front; when gage becomes crowded, meshes on left pushed off; in this way full length of first row completed.

surface with one side of the net flicking along the water. The thrusting stroke (*ko*) is used when the fish is in the water and refuses to rise. The fisherman notes the direction in which the fish is going and drives the net, point down, into the water ahead of the fish and lets the fish run into the net. These fish are termed *mararo mararo* (flying fish below) in distinction with those which take flight.

2. The long-handled fine-meshed net (*tirapa*) has a shorter handle, about 6 feet long, and the mesh is finer than in the flying fish net. It is devised for such smaller fish as the *ihe, marau awa,* and other fish which do not fly.

3. The short-handled net (*kupanga tuki*) has a large frame and a short handle. It is used in the channels on the reef and lagoon. The two methods of using it are

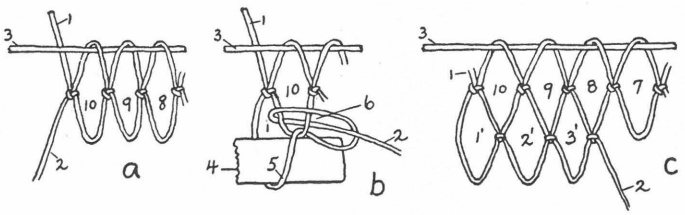


FIGURE 74. Netting technique, second row. *a,* netting turned so that last mesh (10) which ended on right is turned to left with supporting cord (3) still in position, short length (1) of no further use, assistant dispensed with; netting carried on with cord (2) attached to needle. *b,* mesh gage (4) placed in position so that upper edge touches lower end of completed mesh (10) of first row; netting cord brought down behind gage up around lower edge to form lower loop (5); needle then passed through loop of mesh (10), crossing drawn taut on upper edge of gage where held with left thumb, and netting knot (6) made, thus finishing first mesh (1′) of second row. *c,* gage has been removed to show full extent of meshes (1′, 2′, 3′) of second row; intervals between meshes of first row form upper halves of meshes of second row; lower halves formed around mesh gage; in making next mesh, cord (2) will pass over lower end of mesh (7) as in *b.*

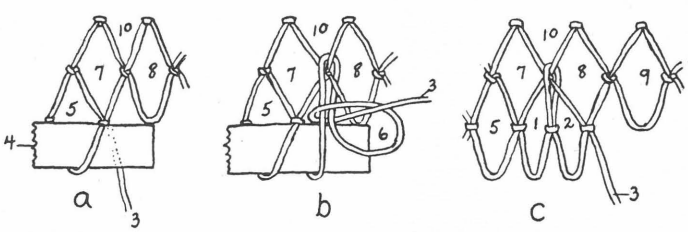


FIGURE 75. Extra meshes (*mata i te tua*). *a,* row of meshes carried along, of which mesh 5 is last completed by knotting to lower loop of mesh 7; instead of carrying cord (3) through next mesh (8) and so completing one mesh in ordinary technique, netter decides to put in extra mesh and so form two meshes between loop of meshes 7 and 8. *b,* cord (3) carried through intermediate mesh (10) of row above, and loop so formed brought down to upper edge of mesh gage (4) where the two limbs held close together against it by left thumb; right hand throws out loose loop (6) to right and proceeds to make netting knot around the two limbs of loop; this forms one mesh to left of knot. *c,* cord (3) brought around back of gage, passed through loop of mesh (8), and netting knot made; mesh gage removed in figure to show the two meshes (1, 2) between meshes 7 and 8; cord (3) can now be carried through next mesh (9) in ordinary technique.

hurahura and *whatawhata*. *Hurahura:* one man places the net in a channel so as to block it, and others drive the fish in on the waves; the man with the net calls to his companions, "Parea mai!" (Drive them toward me!) *Whatawhata:* a channel is selected, in which the net is set; the other channels are blocked with coconut leaves so that the fish from a number of channels are driven to the one where the net is.

4. The baited bag net (*kupanga tata*). (See pl. 8, *A*.) A hoop about 14 inches in diameter and formed of *ngangie* wood is attached to a bag net. A small net 12 inches deep was seen. Two strips of dry coconut flower sheath (*taume*) were crossed over the hoop, to which they were tied. The bait of *tupa* land crab is tied to the central crossing. Four pieces of cord equal distances apart are tied to the hoop, and the ends are brought together to tie to a line. A sinker consisting of a piece of coral is tied to the bottom of the net on the outside. The net is used for catching *kokiri*.

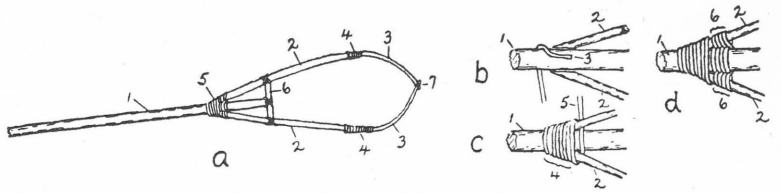


FIGURE 76. Flying fish net (*kupanga maroro*): *a*, handle and frame (*kaututu*); *b-d*, lashing of frame to handle. *a*, handle and frame: 1, handle, 9 or 10 feet long; 2, stout rods (*pukaututu*); 3, shorter thinner rods (*matakaututu*); 4, lashings of *matakaututu* to *pukaututu*; 5, lashing (*tapua*) of *pukaututu* to handle some distance from its end; 6, cross bar, lashed to end of handle and to *pukaututu* to act as spreader; 7, lashing of bent-in ends of *matakaututu*. *b-d*, lashing of *pukaututu* to handle. *b*, thicker ends of rods (2) cut at slant to lie flat against handle at required angle; length of cord placed with one end (3) on handle between rods that it may be covered and so fixed by subsequent turns around handle. *c*, series of close transverse turns (4) made around handle and slanting butt ends of rods binding them firmly together; when divergence of rods reached, cord (5) brought around near rod, over handle, and under far rod. *d*, from last turn, cord brought around far rod, under handle, and over near rod from above; it passes around near rod, over handle, and below far rod as in *c*; by repeating turns (6) rods and handle wrapped separately; end fixed with couple of half-hitches or overhand knot around one of rods.

ANGLING

HOOKS AND LINES

Fish are caught with hooks, baited and unbaited. The baited hooks are of two types, the large wooden two-piece hooks used in catching *Ruvettus* in very deep water, and the smaller one-piece hooks made of pearl shell for catching smaller fish at ordinary depths. The unbaited hook is a form of the widely distributed pearl shell lure trolled from a canoe to catch bonito.

The line material formerly consisted of sennit fiber twisted into three-ply cords. The lines used in *Ruvettus* fishing were of considerable length to reach depths inhabited by the fish. The line shown in plate 9, *C*, *2* is 5 mm. thick, whereas the lines used with the one-piece hooks are from 2 mm. to 3 mm. thick. The introduced cotton line has superseded the old sennit fiber line. The lashings of the larger hooks were made with the two-ply

twisted sennit cord and braid. For the smaller hooks, fine two-ply twisted cords of sennit fiber were used. In the bonito hooks, cotton thread is now used.

THE RUVETTUS HOOK

The hook is made in two pieces from forked branches of tough *ngangie* wood. Kennedy watched a number of hooks being made, from the selection of the branches to the completed lashings, and his minute description (16) of the Ellice Islands hooks shows how the problems that arose in manufacture were solved by natives.

The large part of the hook consists of a shank limb, a point limb, and a fork angle corresponding to the bend of ordinary hooks. The *ngie* plant

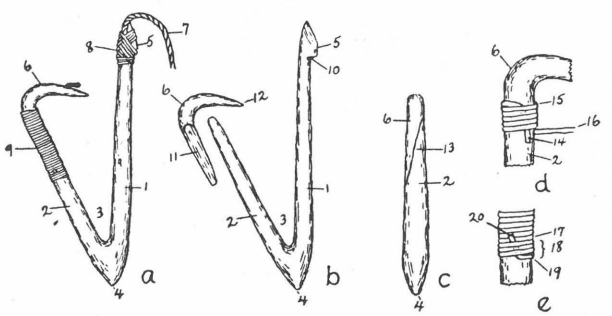


FIGURE 77. *Ruvettus* hook and point lashing: *a-c,* hook; *d, e,* lashing. *a,* hook with completed lashing; *b,* wooden elements; *c,* view from outer side showing scarf: 1, shank limb, 13.25 inches long inside to fork and 15.75 inches outside to angle, diameter is 1.1 inches at fork and 0.65 inch just below snood lashing; 2, point limb, 8.5 inches long inside to fork and 11 inches outside to angle, diameter is 1.1 inches laterally at fork and 1 inch outside owing to scraping down of limb toward angle; 3, fork, below fork wood thickens but slightly (0.1 inch) beyond maximum diameter of limbs; 4, angle, height to fork, 2.5 inches; 5, shank knob, 1.8 inches from lower cut (10) to upper end of shank limb, outer straight part from which it slopes upward to a point is 0.7 inch long; 6, point, from grain of wood does not appear to be fork but to be formed from limb with exaggerated bend, height from lower end to top of curve is 5.2 inches, width from outer side of curve to functional point is 3.8 inches, thickness above point lashing and at curve is 0.7 inch from without in and 0.55 inch laterally; 7, snood; 8, snood lashing; 9, point lashing; 10, lower cut under knob; 11, lower limb of point; 12, functional point; 13, oblique lateral scarf, 4 inches long. *d,* point lashing commencement with scarfed surfaces of point and point limb placed together as in *a:* end (14) of lashing braid laid against side of limb and carried up to just above upper end of limb, where it turns to left and coming from right makes first transverse turn (15) over itself; transverse turns continued downward close together and by continuing to bring braid (16) in turns from right to left on near side, braid end (14) will be buried and fixed. *e,* point lashing finish: transverse turns continued for length of scarf; when lower end reached as by turn 17, three turns (18) below it made over thumb which is removed and last turn (19) pushed upward below them; loose turns drawn taut in order from above down, slack pulled upward, and end (20) cut off above crossing turns; the 28 transverse turns extend slightly above and below scarf.

of the Ellice Islands is the same as the *ngangie* of Manihiki and Tongareva, both linguistically and botanically (*Pemphis acidula*). Kennedy (16, p. 13) remarks that the common branching angle of the *ngie* is about 45 degrees, which is too wide for a good hook. The Manihikians, like the Ellice Islanders, selected forks with a lesser angle. The part beyond the fork angle is trimmed down on the outer lines of the two limbs and brought to a point or apex. It is convenient to refer to the parts of the two limbs that are toward each other as inner and the parts that are away as outer. The

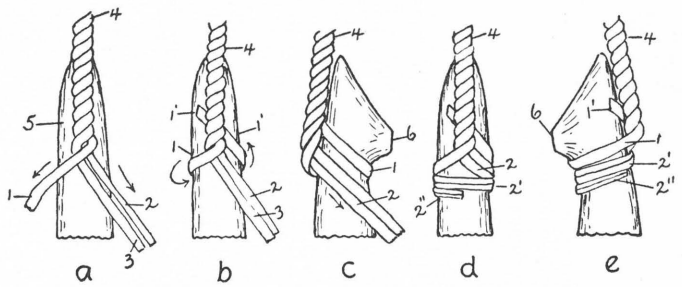


FIGURE 78. *Ruvettus* hook, snood wrapping. *a,* inner point side: end of line or snood (4) unraveled into its three plies (1-3) and laid on inner straight side of shank end (5) with short ply (1) to left and two longer plies to right; lower level of unraveled line just about that of lower notch of knob on opposite side. *b,* inner point side: left single ply (1) carried around back on outer side below knob in transverse turn to reappear on right (1′) where it is drawn firm and sloped upward to cross middle line under snood (4). *c,* right side: two plies on right treated as single element (2) and brought around to right under knob (6). *d,* inner side: plies (2) have passed to right and around back under knob when they appear on left to make transverse turn (2′); plies pass around back again in transverse turn below knob and end up on inner side (2″). *e,* left side, showing turn (1) of left ply with its end (1′) and turns (2′, 2″) of right double plies: so long as these plies kept in position by subsequent lashing they cannot pull up over knob (6).

upper end of the shank limb is narrowed to a point and provided with a knob or projection on its outer side to give support to the snood lashing. The knob is single, and the two knobs with a saddle between described by Kennedy (16, p. 15) are not present in the Manihiki hooks. The upper end of the point limb is cut with a long oblique scarf to fit against the point piece. The point is also made of a smaller fork, but has a wider angle. The lower limb of the fork is scarfed to fit against the point limb, and the upper horizontal limb provides the functional point of the hook. The overlapping scarfs are lashed together with what may be termed the point lashing. A hook from Manihiki and one from Rakahanga illustrate the structure:

1. *Ruvettus* hook from Manihiki (figs. 77-79). The large hook and the point lashing are described in figure 77. The lashing of the snood takes place in two stages, the arrangement of the snood and the actual lashing. In this hook the end of the three-ply

twisted line itself is attached directly to the shank limb. The principle is to unravel the end into its three elements and wrap them around transversely below the knob in such a way that the line cannot possibly pull away from under the subsequent snood lashing (fig. 78). The snood lashing fixes the plies of the snood against the shank and below the knob. The lashing technique consists of figure-of-eight turns in which the crossings are on the inner side and the loops are alternately above and below the knob. (See fig. 79.)

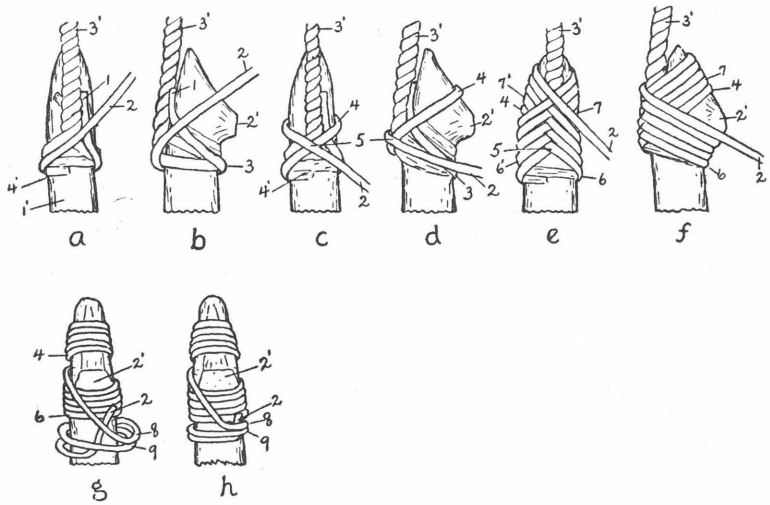


FIGURE 79. *Ruvettus* hook, snood lashing. *a,* inner side: braid end (1) laid against shank (1′) on right of snood (3′) and partly beneath it; braid brought down on right, taken transversely around back under knob brought around on left and crossed over itself as it continues (2) upward to right. *b,* right side: first transverse turn (3) below knob (2′) spaced sufficiently below it to allow of subsequent turns above first loop (3); braid (2) carried obliquely upward to cross upper slanting part of knob and so spaced as to permit of subsequent turns above it. *c,* inner side: braid (2) makes upper loop (4) across back above knob, reappears on left, crosses previous turn and snood wrapping (4′) in middle to form first regular pattern crossing (5), and descends obliquely to right to form another loop below knob. *d,* right side: first loop (4) above knob with first regular pattern crossing (5) and braid (2) passing obliquely downward to right to make second lower loop over first fixation loop (3). *e,* inner side: commencement of lower loop (6) on right where it passes over fixation loop (*d,* 3) and conceals it; appears on left (6′) and ascends to cross above first crossing (5) and continues obliquely upward on right (7) to cross above first upper loop (*d,* 4) covered in figure by braid (2); makes upper loop and reappears on left (7′) above first loop (4); braid continues to make lower and upper loops and to cross in middle line on inner side, each lower loop successively above lowest loop (6) and each upper loop successively above loop 7. *f,* right side: lower loops below knob (2′); above, lowest regular loop (6); upper loops above knob and successively above lowest upper loop (4); crossings on left. *g,* outer knob side: space below knob having been conveniently filled in with about five loops, braid (2) carried obliquely down below knob preparatory to fixation; two loose transverse turns (8, 9) made over thumb which is removed and end (2) of braid pushed up from below under turns. *h,* outer side: turns (8, 9) drawn taut and slack removed by pulling end (2) upward; end cut short; fixation not good, but rough sennit fiber holds very securely.

2. *Ruvettus* hook from Rakahanga (figs. 80-82). The bend of the hook forms a wide U shape in distinction to the V shape of the Manihiki hook. The fork is thick and solid and complies to the form that Kennedy (16, p. 13) describes as *fapuku.* The hook had been in active use, as shown by the marks upon it, and it was abnormal in having a pearl shell point. (See fig. 80.) The pearl shell point is lashed by transverse turns in the same manner as in figure 77, *d-e,* but the lashing is made with two-ply twisted sennit cord 2 mm. thick. The snood of three-ply braid is 4 feet long. The snood wrapping around the knob is made with figure-of-eight turns as in figure 81. The snood lashing is made with two-ply twisted sennit cord with figure-of-eight turns, but the method of fixing the end differs from the previous snood lashing and is shown in figure 82.

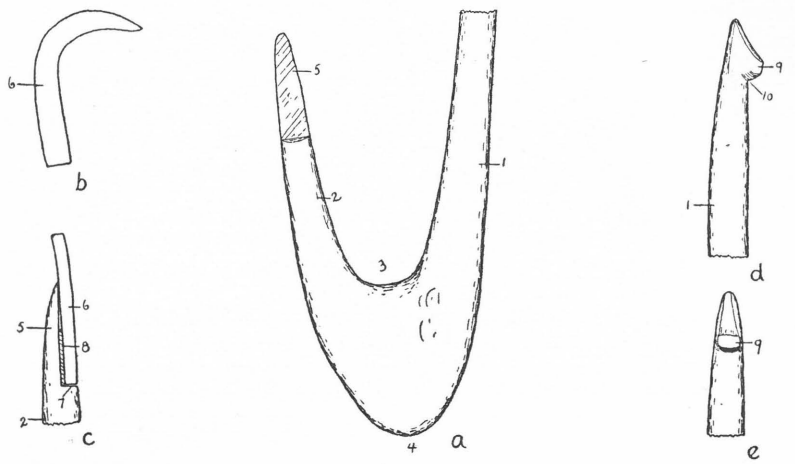


FIGURE 80. *Ruvettus* hook with pearl shell point: *a,* wide U-shaped crotch of point limb and shank limb; *b,* pearl shell point; *c,* scarf joint of point and point limb from outside; *d,* continuation of shank leg from *a; e,* outside view of upper end of shank leg showing knob and narrowing of upper end. 1, shank limb, 7.8 inches long inside to crotch, diameter at lower end from within out is 0.9 inch and opposite diameter is 0.8 inch, at upper end in *a* (4 inches from lower end) diameter is 0.55 inch, and just below knob diameter is 0.4 inch; 2, point limb, 3.9 inches long to crotch, where diameter same as that of shank limb; 3, wide U-shaped crotch, depth is 2.3 inches, outside width on level of crotch is 2.8 inches and thickness is 1 inch; 4, rounded angle; 5, deep scarf of point limb, 1.6 inches long, diameter at lower end is 0.45 inch from without in and 0.5 inch in opposite direction; 6, point, height from lower end to top of curve is 2.3 inches, width from point to outer line of lower limb is 1.7 inches, pearl shell is 0.4 inch wide and slightly less than 0.2 inch thick at lower end; 7, rectangular cut 0.2 inch deep at lower end of point limb scarf; 8, chip 0.85 inch long placed in scarf joint to make outer surfaces of limb and point flush; 9, knob, outer point of knob is short, slightly concave slope to upper end of shank limb, knob is 0.9 inch long from upper end to lower notch; 10, notch, 0.2 inch deep.

Kennedy (16, p. 17) has shown that the Ellice Islanders estimate the clearance required between the point and the shank limb by the thickness of the edgewise thumb with the point against the middle of the nail. Of 25 hooks listed by him, 12 were of the thickness of the thumb, 6 had a clearance of not more than 0.3 inch greater, and 7 were abnormal with clearances ranging from 1 inch to 2.4 inches. A native informant told him that though it was easier for a fish to become hooked on a point with a wide clearance it was also easier for it to escape, whereas a fish takes longer to force its jaws over the point with a narrower clearance, but, once on, finds it difficult to get off again. Expert fishermen thus prefer the wide clearance because it saves time. The Manihiki hook (figure 77) has a point clearance of 1.6 inches and the smaller Rakahangan hook (figure 80), of 1.25 inches. The hooks were thus evidently made for expert fishermen, but lack of data prevents the assumption that they were the type in common use.

In neither of the two hooks is the point directed exactly toward the mesial longitudinal line of the shank limb. Looking toward the point from behind the shank limb, the point in the Manihiki large hook is directed slightly to the left and in the Rakahangan hook, to the right. Kennedy (16, p. 16) gives the explanation of deviation from the middle line in some hooks as being accidental and due to the manner in which the scarf surface was cut on the point limb with the adz. In the Rakahangan hook the scarf was cut with a saw, and it is evident that the plane twisted slightly in sawing the point limb, with the result that the pearl shell point was deflected slightly.

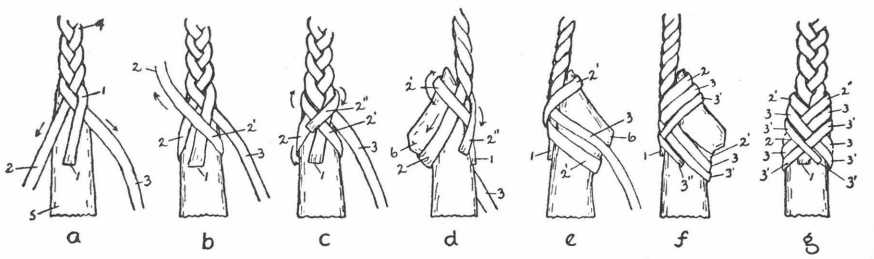


FIGURE 81. *Ruvettus* hook, snood wrapping. *a,* inner side: snood (4) unraveled at lower end and laid over inner side of shank (5) with short mesial ply (1) in middle and two longer plies (2, 3) diverged to sides. *b,* inner side: ply (2) on left passed transversely back below knob, brought around on right; makes oblique turn (2′) over middle ply (1). *c,* inner side: from oblique upward turn (2′), ply carried around back above knob and returns on right to cross obliquely downward (2″) across middle line. *d,* left side: first turn (2) made by second ply below knob; upper turn (2′) above knob (6); final position (2″). *e,* right side: third ply (3) passes obliquely down to right to make loop below knob (6). *f,* right side: third strand makes lower loop (3) below knob; crosses obliquely over middle line on inner side (left) to form upper loop (3); forms lower loop (3′), upper loop (3′), and finally descends obliquely over middle line to end on near side (3″). *g,* inner side, regular crossings of plies in order.

Coral sinkers (*maene*) were used to carry the baited hook down to the bottom. In fishing for *kakahi,* the hook and some ground bait were placed on the flattish surface of the piece of coral, the line near the hook was wrapped around both bait and sinker, and a double loop was passed up under the turn in a form of slip knot. The hook was lowered to the bottom. A jerk made the loop come free and released the hook and ground bait. For

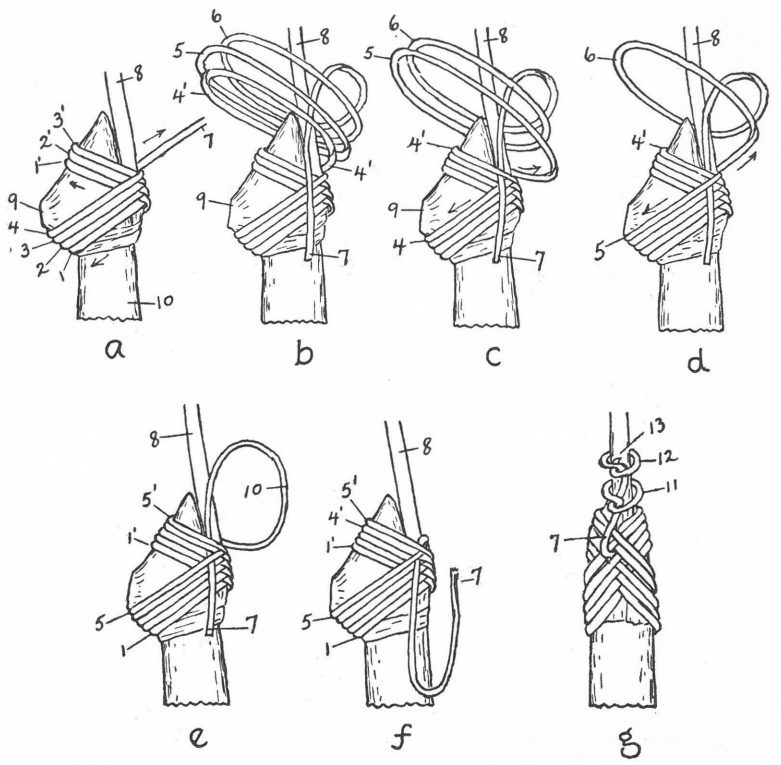


FIGURE 82. *Ruvettus* hook, snood lashing. *a,* left side: snood lashing commenced as in figure 79; figure-of-eight turns have four loops (1-4) in order below knob (9) and three loops (1′-3′) in order above knob; snood (8) shown on inner side of shank (10) but details of wrapping omitted; crossings of loops in middle line over snood; lashing cord (7) passes obliquely upward after making last lower loop (4). *b,* left side: cord makes three long loose loops (4′, 5, 6) around snood, and end (7) brought down through loose loops. *c,* left side: first loose loop carried on upward to complete upper close loop (4′); next loose loop (5) will be used to form next lower close loop. *d,* left side: lower close loop (5) completed; leaves remaining loose loop (6) to finish off as close upper loop. *e,* left side: the close upper loop (5′) completes figure-of-eight turns, with five lower loops (1-5) and five upper loops (1′-5′); certain amount of slack (10) left. *f,* left side: slack removed by pulling down on end of cord, which, after tautening of loops, is crossed by ascending loop (4′), descending loop (5), and last ascending loop (5′). *g,* inside view: cord (7) turned upward over crossing turns and tied around snood (8) with two overhand knots (11, 12); end (13) cut off.

Ruvettus (*paru*), it was said that the stone was tied with a strip of lauhala and the end tied to the hook. When the fish took the bait, it cut the lauhala strip and released the stone. The fishermen held that the fish followed the sinker down to the bottom. If the detachable method is used, the line should be drawn up gently (*whakapura*) so that the fish, seeing the movement of the bait, may leave the stone and follow the bait upward.

ONE-PIECE HOOKS

Baited hooks of various shapes were made in one piece from pearl shell. Four types were described, but specimens of only three were procured. (See pl. 9, *B*.)

1. Wide U-shaped hook (*tope*), used with a line to catch *tukoro* and *marau*. The bait (*maunu*) was of fish. (See fig. 83, *a*.)

2. Narrower U-shaped hook (*matau kiokio*) for catching *kiokio*. (See fig. 83, *b*.)

3. Circular hook (*koma*), baited with *koperu* and flying fish for catching *kakahi, para, roroa,* and *ruhi*. (See fig. 83, *c*.) A small *koma* was used for *koperu, maroro, karehe,* and *pawa*.

4. Small hook (*matau kokiri*) for catching *kokiri,* used with a short rod of about one arm span in length and drawn (*matau kume*) through the water. The bait was land crab (*kavou*).

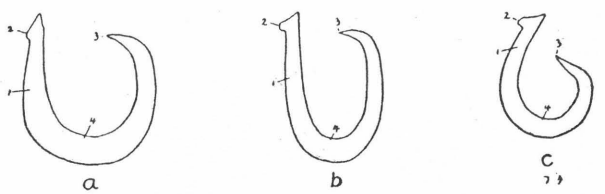


FIGURE 83. One-piece pearl shell hooks: *a, tope; b, matau kiokio; c, koma.* 1, shank; 2, knob; 3, point; 4, bend. *a, tope:* greatest depth, 2.1 inches; greatest width, 1.9 inches; greatest width of shell material, 0.4 inch at bend; greatest thickness, 0.2 inch at shank and 0.1 inch at point; clearance at point, 0.9 inch. *b, matau kiokio:* greatest depth, 2.2 inches; greatest width, 1.4 inches; greatest width of shell, 0.4 inch, narrows considerably as hook ascends to curved-in point; greatest thickness, 0.2 inch; point clearance, 0.5 inch. *c, koma*: greatest depth, 1.8 inches; greatest width, 1.4 inches; greatest width of shell, just less than 0.3 inch; thickness of shell, 0.2 inch; point clearance, 0.4 inch.

Charles Nordhoff gave me some other names of hooks obtained from a Manihikian living in Tahiti, but I was not able to confirm the names and types at Manihiki.

The three hooks obtained are all lashed to snoods of three-ply twisted cords, two of sennit and one evidently of foreign *oronga* fiber. The lashing thread in one is in the old-time form of thin two-ply twisted sennit fiber.

The snood lashing follows the *Ruvettus* hook lashing in using figure-of-eight turns, but with the smaller one-piece hooks both ends of the thread are

buried at the commencement of the lashing. The figure-of-eight turns are made with the large loose loop through which the hook can be passed after each turn in order to remove the twist. After the last turn, the end is drawn to remove the slack. The two main forms of lashing are distinguished by the successive figure-of-eight turns, which are made in either ascending or descending order. The ascending snood lashing is shown in figure 84 and the descending snood lashing in figure 85.

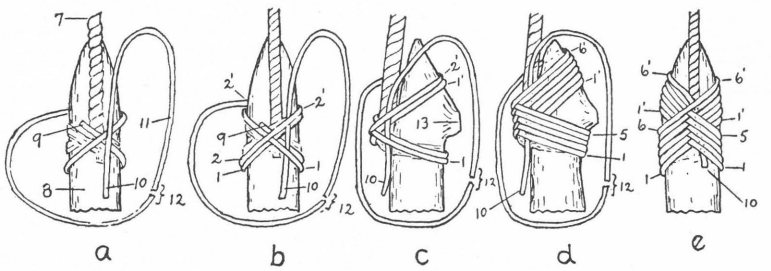


FIGURE 84. One-piece hooks, snood lashing, ascending figures-of-eight. *a,* inner side: snood (7) placed on inner side of shank (8) and unraveled ends wrapped around knob in one of methods shown in figures 78 and 81; commencement end (9) of lashing thread laid obliquely over snood wrapping, takes turn obliquely downward toward right, transversely across back below knob, appears on left, and crosses obliquely upward to cross in middle line and takes transverse turn across back above knob to appear on left; commencement end (9) fixed by oblique turn which passes over it and will be completely buried by subsequent turns; far end (10) of thread laid vertically downward to right of middle line sufficiently far down to be below crossing loop; large loose loop (11) formed and gap (12) indicates where most of it has been left out of figure for convenience in drawing. *b,* inner side: downward turn (1) made from last figure obliquely to right when it crosses vertical end (10) and keeps below first turn from end (9), which is regarded as fixation turn and will be subsequently covered; thread passes transversely across back to left, where it appears (2) above previous turn (1) on that side and ascends obliquely to right (2′) to cross back transversely to left (2′); in ascending turn, thread crosses end (9). *c,* right side: first loop (1) below knob (13) with fixation loop above it and loops (1′, 2′) above knob; lowest loop (1) sufficiently below knob to allow ascending series of loops to be spaced between it and knob; first upper loop (1′) spaced sufficiently far below upper end of shank to allow room above it for ascending series of upper loops; figure-of-eight turns will follow closely above each preceding turn. *d,* right side: series of five lower ascending loops (1-5) and six ascending upper loops (1′-6′) conclude series, only five loops show below because fixation loop has been covered. *e,* inner side: crossings of the two sets of loops in middle line, owing to covering of fixation loop, five turns show on right but six on the left; end (10) of lashing thread pulled down to remove slack and cut off below lowest turn (1).

A bait string (*takere maunu*) made of thin two-ply twisted sennit cord is tied with a slip knot to the shank just below the snood lashing. After the bait is put on, a few turns are taken around it with the bait string to prevent it from being removed too easily by fish.

Ground bait or chum (*whakaruru*) and fish are used as bait. For *kokiri,* chewed land crabs (*tupa*) or sweet coconut husk (*mangaro*) are used and also the *uto* stage of the coconut husk.

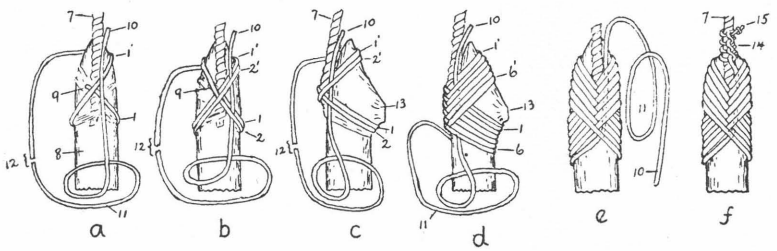


FIGURE 85. Snood lashing, descending figures-of-eight. *a,* inner side: commencement end (9) placed as in figure 84; thread descends obliquely to right and forms first transverse loop (1) below knob and close to it; thread ascends obliquely from left to cross in middle line over snood (7) and fix commencement end (9); it makes first upper loop (1′) close to upper end of shank (8); far end (10) of thread laid vertically upward and large loose loop (11) formed with gap (12). *b,* inner side: second lower loop (2) and second upper loop (2′); turns follow close below preceding turns and cross the vertical end (10). *c,* right side: relationship of upper loops (1′, 2′) and lower loops (1, 2) to knob 13; first loops have enough space below for descending series. *d,* right side: completed upper loops (1′-6′) and lower loops (1-6) in descending order with slack (11). *e,* inner side: end (10) of thread pulled upward and slack (11) drawn through. *f,* inner side: slack tied in series of four half-hitches (14) around snood; end stoppered with overhand knot (15); slack cut off.

THE BONITO HOOK

The bonito trolling hook (*uhi pa*) is a two-piece hook consisting of a shank (*pa*) and a point (*kawiti*). The point is pierced with holes (*puta*) through which it is lashed (*whawhau*) to the distal end (*rau*) of the shank. The distal lashing also includes the hackle (*whakahuru*). The line or snood (*taka*) is looped around the base of the point, where it is included under the point lashings. The snood is also attached to the shank by a lashing passing through a hole pierced through the thick proximal end (*pu*) of the shank. In some hooks little filler sticks (*mono*) of short pieces of coconut leaflet midrib are placed on either side of the snood loop around the point base and included with it under the lashing to steady the point on the shank.

Nordhoff (21, p. 240) records some different terms: *parau* (shank), *kaharu* (hackle), *kereka* (lashings), *roniu* (snood), *tuketuke* (thick part of shank), *fao* (holes), *kave* (line to rod), and *fakaketa* (filler stick). Of these terms, *parau* is also the general term for pearl shell and *kahuru* another form of *whakahuru.*

The shank is cut from the shell in a long, narrow strip so as to include a part of the hinge to form the thicker proximal end, while the other thinner

end includes some of the colored part toward the lip of the shell. Of 25 hooks examined, the length ranges from 82 to 118 mm., but a fair average length is about 95 mm. The width at the widest part ranges from 12 mm. to 20 mm., but a fair average width is about 16 mm. The width at the tail end ranges from 8 mm. to 13 mm., but most hooks are 9 mm. to 11 mm. wide at the tail. A good deal of variation thus exists, some shanks being long and narrow and others short and wide. Variation also exists in the size of the head, which of course depends on the section through the different parts of the hinge. Nordhoff (21, p. 243) points out that in Tahiti the middle section (*ihuroa*) of the valve was the most prized, and that the sections on either side of it (*hiti*) were also used. The Manihikian and Rakahangan people are hospitable and much given to making such presents of local manufacture as mats, hats, baskets, and fans. Bonito hooks are now also used as gifts. It is evident that a person making hooks is inclined to use as much of the shell as possible. Thus, some of the outer sections contain very little hinge and consequently a small head. The hook-maker probably uses the hooks made from the middle sections for his own fishing and gives the others away as presents to visitors. Others again are made for sale to Europeans who buy them as curios, to which category the hooks literally belong. The shell was originally cut with thin pieces of hard coral (*punga*) rubbed along the lines of the section and assisted with a little water, but now the saw is used entirely. The shaping was also done by rubbing with coral, but the introduced grindstone has taken its place. The outer surface of the shell forms the back of the hook, and the rough surface is ground down to bring out the white pearly color of the head and the iridescent colors on the back of the tail. The shell section retains its natural longitudinal curve. The inner natural nacreous white surface of the shell forms the front of the hook over the *rau*. The hinge part is ground not only to converge the sides to a proximal point, but the grinding is sloped inward on the front from both sides to form two inclined surfaces which meet in a mesial anterior edge. This edge in most hooks is ground down distally to a small triangular surface which meets the nacreous anterior surface where it curves up on the inner side of the hinge. The proximal end is sloped downward to meet the two side edges in a point. The head is thus triangular in section, with a back and two inclined antero-lateral surfaces. At a distance from the point which varies according to the size of the shank, a hole is bored transversely from side to side about midway down the thickness of the head. Two grooves are made on each side of the tail end to correspond with the holes in the separate point piece. Finally, in some hooks, a longitudinal mesial groove is cut on the back of the tail end. Some variations in the shank are shown in figures 86 and 87. In grinding

down the back of the shank, much attention is paid to bringing out the iridescent colors in the distal half or third of the section which includes the colored outer circumference of the shell lip. Too much grinding removes the color altogether, whereas insufficient grinding leaves it too dull. After removing the dull rough material from the outer surface, the hook-maker proceeds carefully. Every now and then he dips the shank in water and holds it up to the light and thus obtains what he judges to be the right shade.

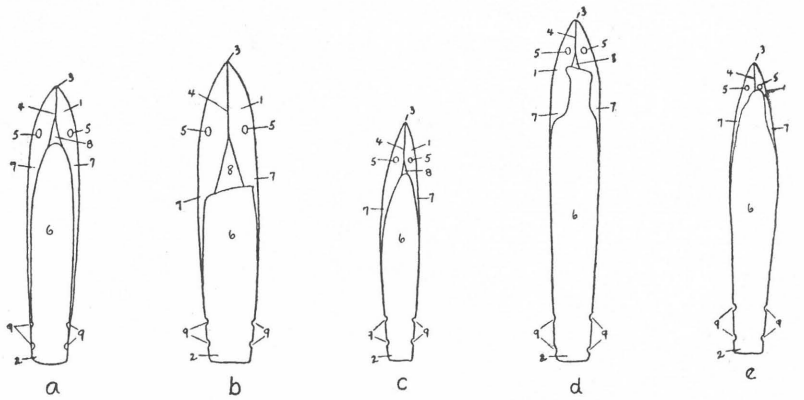


FIGURE 86. Bonito hook shanks, front: *a,* average type of shank (C. 2797) with well marked head, 95 mm. long, greatest width is 17 mm., tail width is 11 mm.; *b,* longer and wider shank (C. 2792) with large head and mesial edge ground down to comparatively large triangular surface (8), 103 mm. long, greatest width is 20 mm., tail width is 13 mm.; *c,* small shank (C. 2803) with small head formed from side section of hinge, 81 mm. long; greatest width is 13 mm., tail width is 9 mm.; *d,* long shank (C. 2794) with small head formed from side section of hinge, nacreous surface irregular at head end owing to irregularity of sides of hinge, 117 mm. long, greatest width is 16 mm., tail width is 11 mm.; *e,* long shank (C. 2937) from outer section through hinge, owing to shortness mesial edge not ground down to form triangular surface, 101 mm. long, greatest width is 15 mm., tail width is 10 mm. 1, head; 2, tail; 3, head point; 4, mesial edge; 5, head hole; 6, front natural nacreous surface; 7, expansion of sides formed by thickness of shell into antero-lateral surfaces which meet in mesial edge; 8, small tra-angular surface ground down on mesial edge to hold snood firmly; 9, tail grooves, made after fitting point.

This care is universal in the making of lures. I watched the procedure in Samoa, Nordhoff (21, p. 243) describes it for Tahiti, and Kennedy (16, p. 42) for Ellice Islands. Different shades of color are also obtained by seeking other shells, most of which come from particular localities. The shells thus sought after are designated by special names. Nordhoff (21, p. 241) enumerates 15 shell names for the island of Tahiti and 12 for Moorea, besides names peculiar to others of the Society Islands. The particular shells were found in their own distinctive localities. In Rakahanga

the following five names were obtained, but there are others (the names were applied to the completed shanks, and the color specified is that of the back of the shanks in the tail half): *tua kotaha* (back of man-of-war hawk), dark; *ata,* reddish (*muramura*); *kau overu,* like the *ata,* but colors mixed (*hiro*); *marauuava,* the reddish color is deeper; *kamuka,* tail, as well as head, is white, name derived from resemblance to the white ribbons (*kamuka*) obtained from the front surface of unopened coconut leaves. Different colors are used to meet different atmospheric conditions. Nordhoff (21, p. 242) is convinced that the bonito recognize

> . . . the correct shell for the conditions of weather, time of day, and the small fry on which they are feeding. One has only to put on a pair of diver's goggles and get under water for a "fish-eye" view of a variety of bonito-hooks trolled overhead, to perceive that the bonito's view of the shanks, in the water and against the sunlight, is different from ours. Often, out of a dozen hooks available aboard a canoe, there will be only one at which the fish will strike freely; yet all twelve have been chosen by expert fishermen.

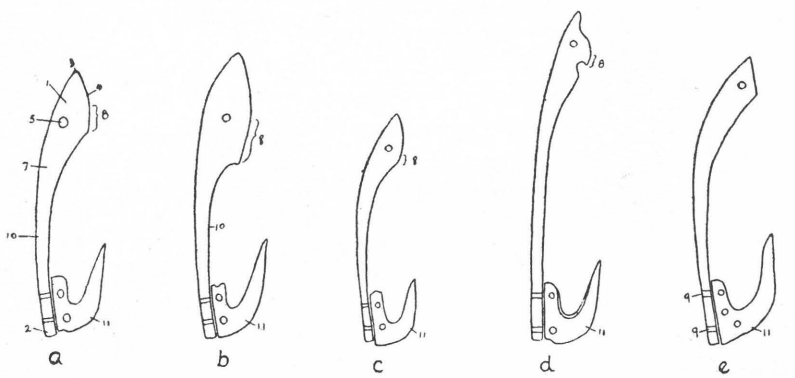


FIGURE 87. Right side view of same bonito hook shanks as those in figure 86, posterior longitudinal convexity corresponds to outer curve of shell, front concavity increased by inner projection of hinge which forms head, points in position to indicate how tail grooves cut after fitting point against shank: *a,* shank with normal-sized head, head is 12 mm. thick, tail is 4 mm. thick, middle thickness is 6 mm.; *b,* large thick shank with exaggerated head well ground down to reduce its thickness, head is 16 mm. thick, tail is 4 mm. thick, middle thickness is 6 mm.; *c,* thin shank with marked small head, head is 8 mm. thick, tail is 2 mm. thick, middle thickness is 4 mm.; *d,* long shank with rough irregular small head from outer section of hinge, head is 11 mm. thick, tail is 3 mm. thick, middle thickness is 4 mm.; *e,* shank with small head, pronounced longitudinal curve, point with three holes only two of which necessitate cutting of grooves for lashing, head is 10 mm. thick, tail is 3 mm. thick, middle thickness is 5 mm. 1, head; 2, tail; 3, head point; 4, mesial edge; 5, head hole; 7, antero-lateral surfaces of head; 8, distal triangular surface on head; 9, tail grooves made after fitting point; 10, sides of shank, continuous with antero-lateral surfaces of head; 11, point.

The Polynesian fisherman used his experience and skill in preparing different shades of shank for his bonito hooks in much the same way as the

trout fisher expends his ingenuity in creating different forms of fly hooks for trout.

The point (*kawiti*) follows the same form as that used in Tongareva and western Polynesia. This is characterized by a proximal prolongation of the base and thus carries the technical "bend" of the hook. Nordhoff (21, p. 240) states that the Manihiki point is "generally of tortoise-shell" and attributes to the thinner nature of the material the use of filler sticks. All the hooks I have seen from Manihiki and Rakahanga resemble the Tongarevan hooks in having the points made from the outer part of the pearl shell. One side of the point is thus white and nacreous and the other side, which corresponds to the outer surface of the shell, is dark. The outer surface is not ground down sufficiently to bring out the iridescent colors of the shell, as it is unnecessary in this part of the hook. The thickness of the shell ranges from 3 mm. to 6 mm., but thicknesses of 4 mm. and 5 mm. are most common. The method of lashing the point to the shank is through holes pierced through the point. The proximal prolongation of the base makes is possible to pierce a second hole through to provide for two lashings. The length of the base for 18 hooks with two holes ranges from 18 mm. to 23 mm. In 7 hooks, an extra third hole is pierced through the proximal prolongation, and in these hooks the base length ranges from 20 mm. to 25 mm. The holes are from 1.5 mm. to 2 mm. in diameter and the height of the proximal prolongation of the base is 5 mm. to 6 mm., to prevent the proximal hole or holes from breaking through the upper edge. Now and again the hole does break through and the proximal lashing passes over a groove, as in so many of the Tongarevan hooks. Variations are shown in figure 88.

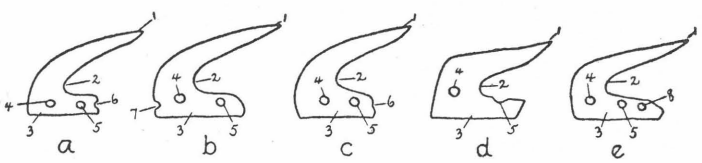


FIGURE 88. Bonito hook points (*kawiti*): *a*, point with almost angular bend; *b*, point with more rounded bend; *c*, point with back rounded and curved edges rounded off; *d*, point with square back, proximal hole broken through to form groove still effective for lashing; *e*, point with third hole for snood. 1, functional point; 2, bend; 3, base; 4, distal hole (*puta muri*); 5, proximal hole (*puta mua*); 6, 7, grooves for snood loop; 8, third extra hole.

The snood (*taka*) consists of a piece of fishing line from 18 inches to 30 inches long. This is attached to both the point and the shank. It is attached to the point by a closed loop passing around the base of the point, or by a line through a hole in the base of the point. The loop method is the more common. In the series of 25 hooks, 19 are attached by the closed

loop and 6 by the hole method. Of the 6 hooks attached through a hole, 5 of the points have three holes and 1 has two. In the hooks with three holes the snood was passed through the proximal extra hole in 4, and it passed through the middle hole in the other. In all hooks, two lashings were made through holes not occupied by the snood. In the hole method used with two holes, both the proximal lashing and the snood passed through the proximal hole, and the technique thus resembled that common in Samoa. In Samoa the snood is passed through the proximal one of two holes, which it shares with the proximal lashing, but a third extra proximal hole is sometimes made for the snood alone. Both methods of using the proximal of two or three holes are also described for Ellice Islands by Kennedy (16, p. 44). The loop method is used in Tongareva. Loop and hole methods are described in figure 89.

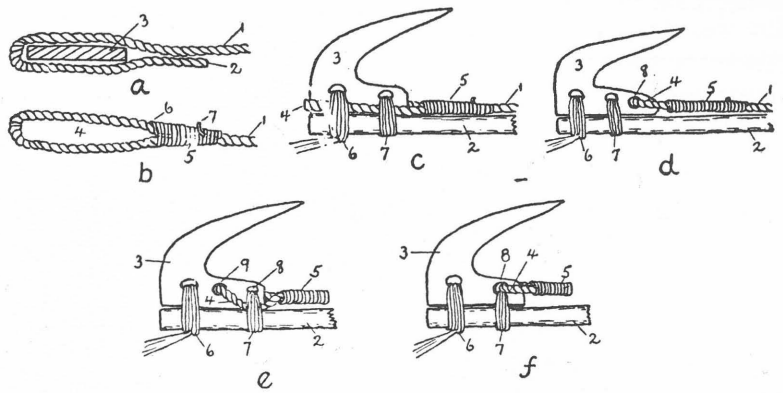


FIGURE 89. Bonito hook, attachments of snood to point. *a*, snood (1) looped around base of point (3) and end (2) brought back along standing part for overlap ranging from 12 mm. to 30 mm.; overlap generally short, and in no loop does short end reach head of shank. *b*, overlap closely seized with lashing (5) of thin thread, which commences distally with first turn (6) which crosses bent-down end; subsequent close turns bury and fix end; close turns continued past short end for few turns, when three or four loose turns made and end (7) of thread turned back under them; loose turns successively drawn taut commencing distally and end (7) pulled to remove slack which is then cut off; loop (4) thus closed. *c*, side view of closed loop (4) in position around base of point (3), with close seizing (5) and snood (1) resting on tail end of shank (2); loop kept securely in position by lashings (6, 7) which pass over it; thus loop has to be placed around base of point before lashing commences. *d*, snood (1) passed through proximal one of three holes (8), bent back and seized as in large loop; lashings (6, 7) distal to loop made by snood through proximal hole and do not affect it; thus not necessary to tie snood before lashing point. *e*, exceptional lashing: snood (4) passed through middle hole (9) and then seized (5); proximal lashing (7) then passed over snood loop (4); because of position of holes, snood passed through middle hole instead of proximal hole (8) to prevent lashings from being too close together. *f*, lashings (6, 7) made first through holes in base of point; snood (4) passed through proximal hole (8) above lashing threads, doubled back, and seized (5); resembles the Samoan usage but subsequent details of lashing quite distinct.

Considerable variation exists in the methods of lashing (figs. 90-95). The two lashings may be made with two separate pieces of thread, involving two commencements and two end fixations, or they may be made with one continuous thread, with only one end to be disposed of at beginning and finish. The lashing may or may not have side bindings consisting of loops passed around the lashing between the shank and the snood loop. The side bindings may consist of simple loops, half-hitches, or overhand knots. In some hooks the proximal lashing is made first, and in others the distal lashing comes first. The hackle may be lashed by some of the turns of the distal lashing, or it may be attached separately after the lashing of the point is completed. In some hooks the thread is carried back and forward between the two lashings in a manner that adds to its complication but does not improve its appearance. Different fishermen seem to have adopted extra details of their own and to have departed from a set method. A double cotton thread is now universally used for the lashings, but in the diagrams in this study a single thread is depicted for the sake of clearness.

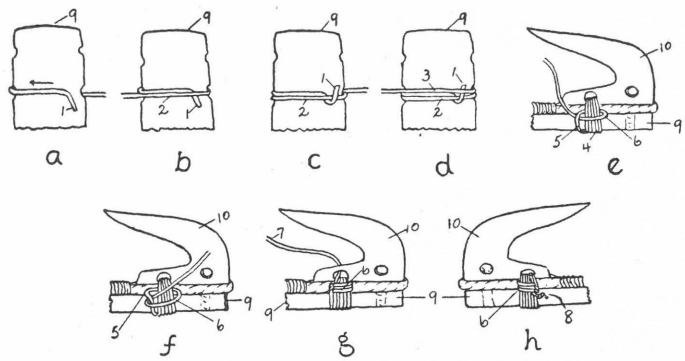


FIGURE 90. Bonito hook, single lashing through proximal hole: *a-d,* fixation of commencement end; *e,* half-hitch side binding; *f,* overhand-knot side binding; *g,* completion, first side binding; *h,* completion, second side binding. *a-d,* fixation of commencement end: back of shank (9) toward craftsman with distal tail end above; end (1) of thread turned down on shank; thread passed around clockwise through proximal hole in point; transverse turn (2) across back of shank crosses turned-down end of thread; end (1) turned back over turn which crossed it; transverse turn (3) crosses thread and fixes it. *e,* half-hitch side binding: after eight or ten turns (4) through proximal hole, over proximal grooves on shank sides, and over snood loop, shank turned with tail to right; thread, coming up from back of shank, passes through under lashing to form loop (5), makes turn (6), and passes under loop (5); thread tautened and couple more half-hitches made in same manner. *f,* overhand-knot side binding: loop (5) made in same way as for half-hitch, but thread, after making turn (6) over lashing, passes over loop (5) and up under it from outside; thread tautened and couple similar turns made. *g,* completion, first side binding: after three half-hitches or overhand knots made close together (6) in ascending order, thread (7) passes through proximal hole to other side. *h,* completion, second side binding: three similar side loops (6) made in descending order on opposite side; overhand stopper knot (8) made on thread and run close down to lashing; surplus thread cut off.

The hackle formerly used was said to consist of coconut husk fibers, but white pig's bristles or horsehair are now used. A tuft about 3 inches long is bound around the middle with a single turn of thread and tied with a reef knot.

One of the methods of lashing resembles that of Tongareva; as the Tongarevans are a more conservative people, it is probably the oldest or original method. Two pieces of thread are used, the proximal lashing is made first, and side bindings are used. The proximal lashing is shown in figure 90. The distal lashing resembles the proximal in the fixation of the commencing end, but after 6 or 7 turns the hackle is fixed by 4 successive turns. The side bindings are then made as in the proximal lashing and the end fixed in the same way. The hackle fixation is given in figure 91. A continuous thread for the two lashings may be commenced with the proximal lashing, after the completion of which the thread is passed through the proximal hole, carried on to the distal hole, passed through it, and the distal lashing commenced (fig. 92). The use of a continuous thread for two lashings commencing with the distal lashing is shown in figure 93. Its feature is the leaving out of the commencement end which is later tied to the finishing end in a reef knot to fix the lashing. The use of the two ends to tie a finishing

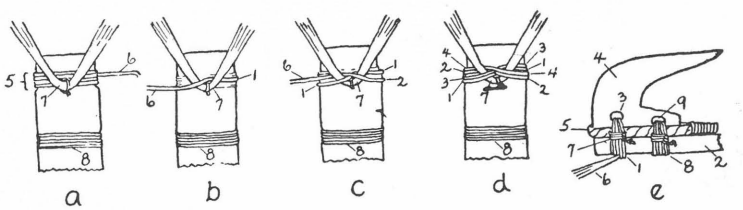


FIGURE 91. Bonito hook, distal single lashing and hackle fixation. *a*, after commencing end fixed and five or six turns (5) made around shank and through distal hole of point, back of shank turned toward craftsman with working thread (6) on right; hackle (7) bent at middle is laid over lashing turns with convexity downward and projecting slightly below lower edge of lashing turns, kept in this position by left thumb; proximal lashing (8) completed. *b*, first hackle turn (1) made by bringing thread (6) obliquely across back beneath right limb of hackle (7) and over left limb. *c*, thread after passing up left side of shank and through distal shank hole is brought down on right, makes oblique turn (2) across back of shank, over right limb of hackle, and beneath left limb, thus crossing first hackle turn (1) in middle line; establishes principle of hackle fixation; each turn an ordinary lashing turn passing around shank and through distal hole, but on back of shank oblique so as to cross alternately under and over each limb of bent hackle. *d*, completed hackle fixation of four turns: from *c*, third turn (3) followed above first turn (1) and fourth turn (4) followed above second turn (2); crossings form neat pattern in middle line; manner in which turns cross limbs of hackle keep it in bent position with limbs directed back and out. *e*, completed distal and proximal lashings: after fourth turn over hackle, thread taken up on left and side binding made around lashing on left; thread passes through distal hole and makes side binding (7) on right when thread finished off with stopper knot as in proximal lashing.

knot marks a departure from the usual Polynesian technique, and it may be fairly modern. Some other variations are shown in figure 94.

Complicated combinations of the methods described are to be found on a few hooks, in which oblique crossings between the lashings are made on both sides. It may be stated, therefore, as an aid to the analysis of bonito hooks from unrecorded localities, that if the snood loop surrounding the base of a shell point is used with additional crossings between the lashings other than those figured here, the probabilities are that the hook came from Manihiki or Rakahanga.

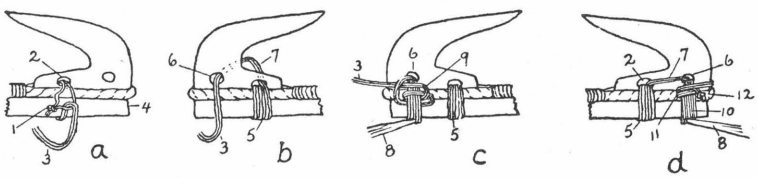


FIGURE 92. Bonito hook, continuous lashing commencing with proximal hole. *a*, fixation of commencement: commencement end (1) of double knotted thread passed through proximal hole (2) from far side; working end (3) brought around shank (4) and passed through knot loop; thread turned back under shank to draw loop taut and place knot in side groove of shank. *b*, completion of proximal and commencement of distal lashings: after series of ten turns (5) through proximal hole, thread (3) brought through distal hole (6) from far side; loop (7) to be drawn taut. *c*, fixed hackle and first side binding: hackle (8) fixed as in figure 91, *d;* thread from last hackle turn brought through hole (6) and two half-hitches (9) made around lashing; these drawn taut and thread (3) carried around back of point above snood loop to make second side binding. *d*, completed lashings: thread carried over lashing (10), passed back under it; single half-hitch (11) made; thread stoppered with overhand knot (12); end cut off.

Of the series of 25 hooks, 15 had the hackle lashed by the turns of the distal lashing as in figure 91; in 9, the hackle was separately attached to the distal lashing after it had been completed. In one hook, a continuation of both methods was used. (See figure 95.)

For the head lashing the snood is carried back over the median edge of the head and thus passes along above the transverse hole. The snood is not drawn taut, but loosely follows the concavity of the shank. The snood is lashed to the head with a thread passing through the head hole and over or around the snood. The simplest form of head lashing is shown in figure 96. A more complicated lashing is formed by adding some figure-of-eight turns around the snood in addition to those of the lashing above. (See figure 97.) The neatest form of lashing differs from the previous two in that turns are made around the snood as the thread passes over it. (See fig. 98.) This form was in use in Tongareva and Samoa (28, p. 502). The seizing around the snood, which fixed the free end of the lashing thread, is shown on the right or proximal side of the lashing in the three hooks

figured. In four hooks of the series examined, the seizing was on the left or distal side of the lashing. A completed lashing is shown in figure 99.

Filler sticks (*mono*) made of coconut leaflet midrib are not a constant feature, there being but 4 hooks so treated out of the series of 25. Nordhoff (21, p. 240) states, "The Manihiki point is generally of tortoise shell, and being thinner than the bone points used elsewhere, a little filler stick, a bit of the midrib of a coconut leaflet, is placed on each side of it, under the lashings. These sticks are called *fakaketa* (make taut)." I have never seen a Manihiki point made of tortoise shell, and there can be no doubt that the material generally used is pearl shell. In Samoa the turtle-shell point

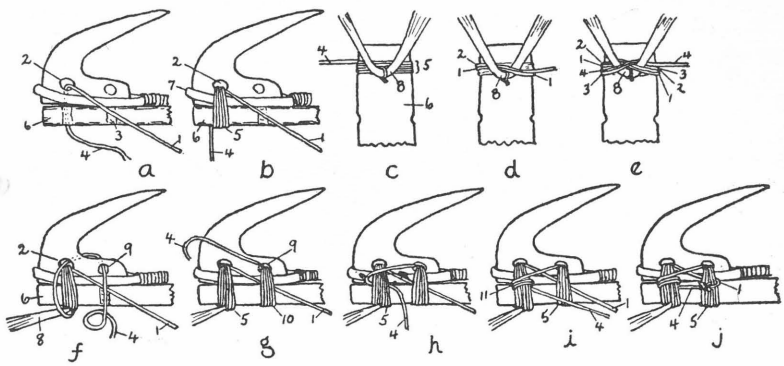


FIGURE 93. Bonito hook, continuous lashing commencing with distal hole. *a*, commencement end (1) of double thread 32 inches long brought through distal hole (2) to near side and left sufficiently long to pass well over proximal shank groove (3) on near side of shank. *b*, long thread (4) brought up under shank, makes series of six simple turns (5) around shank (6), through distal hole (2), and over snood loop (7); direction of turns on near side, from below upward. *c*, with completion of sixth turn thread passes through distal hole to far side; back of shank turned toward craftsman; thread (4) appears on left side on shank (6) and turns across back will be from left to right; hackle (8) placed in position on lashing turns (5) already completed. *d*, hackle fixed by four oblique turns passing under one limb of hackle and over other; first turn (1) passed under left limb and over other; second turn (2), instead of alternating (fig. 91, *c*), follows above first turn (1), making a similar pair. *e*, third turn (3) alternated by passing over left limb of hackle and under right limb; fourth turn (4) follows above it, thus balancing first pair. *f*, fixation of hackle (8) completes distal lashing; thread (4) brought up on near side, passes through distal hole (2) to far side, brought back through proximal hole (9) to commence proximal lashing; thread slack to indicate its course, brought down on near side in proximal groove in which it crosses short commencing end (1) drawn obliquely across groove; direction of lashing turns on near side, from above down. *g*, six lashing turns (10) made around shank and through proximal hole, all of which cross short end (1); thread (4) appears through proximal hole (9) and is taken over distal lashing. *h*, thread looped over distal lashing (5) and brought forward under it. *i*, two more simple binding turns (11) taken around distal lashing, without half-hitches or overhand knots; thread (4) carried over to proximal lashing (5) where its end comes into opposition with short commencing end (1). *j*, ends of threads (1, 4) tied in reef knot above proximal lashing (5), lashing complete.

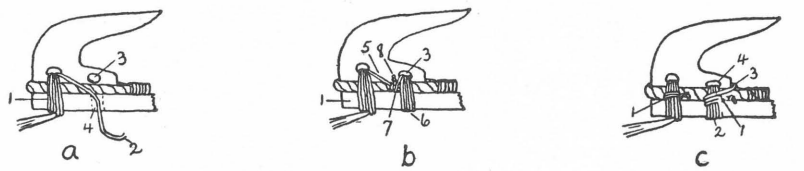


FIGURE 94. Bonito hook, variations in point lashing. *a,* distal lashing (1) with concealed commencement finished first; thread (2), instead of passing directly through proximal hole (3), carried obliquely across to proximal groove (4). *b,* completion of lashing commenced in *a:* thread passes around shank in proximal grooves, through proximal hole from far side, and descends on near side to cross over oblique thread (5); subsequent turns to complete lashing (6) fix oblique thread firmly; thread in last turn (7), after passing through proximal hole, makes couple of half-hitches (8) over oblique thread (5), is stoppered with overhand knot. *c,* point lashed with two separate threads; lashings finished on near side with side bindings (1); in proximal lashing (2), last turn (3), instead of coming through proximal hole, comes around proximal end (4) of point to form side binding (1).

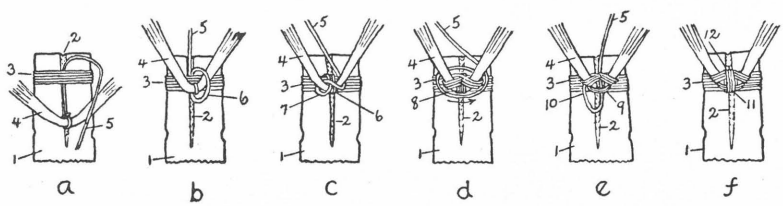


FIGURE 95. Bonito hook, modern separate attachment of hackle to distal lashing. *a,* shank (1) has median groove (2) filed on back from tail end; when distal lashing (3) completed, groove forms space beneath through which thread may be passed; hackle (4) tied in middle to one end of thread (5) about 7 or 8 inches long; owing to smallness of groove, needle used to thread free end through, but method, though modern, is ingenious and marks distinct development; with back of shank toward craftsman and tail end upward, free end of thread passes through groove under lashing from below upward. *b,* hackle drawn up into position on lashing (3) and thread looped (6) over middle and again passed upward under lashing. *c,* five median loops made and drawn taut (6); thread, after emerging from below upper edge of lashing, passes down over left limb of hackle and loops (7) around it; thread crosses middle line, passes over right limb of hackle and around it to form second loop of figure-of-eight turn. *d,* three figure-of-eight turns made around the two limbs with crossings in middle line regularly displayed; from last turn on right, circumferential turn (8) made from right to left above and left to right below lashing. *e,* three circumferential turns (9) made, each being drawn taut as completed; result is to draw hackle bend a little upward over distal lashing; from last turn (10), thread passes through groove under lashing from below upward. *f,* slack drawn taut and three median turns (11) made over hackle end through groove; after last turn, thread (12) cut off short in groove at upper edge of distal lashing; no knot or other fixation needed.

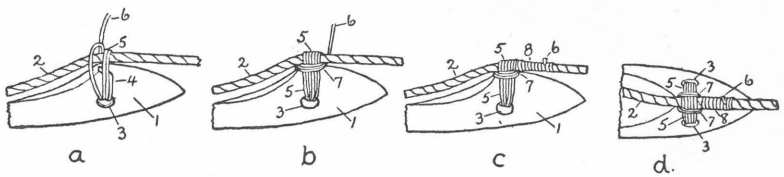


FIGURE 96. Bonito hook, simple snood-head lashing: *a-c*, side views; *d*, top view. *a*, shank head (1) held with median ridge and snood (2) up; hole (3) through head; head point to right; commencing end (4) of thread passed through hole from far side, laid vertically against near side of head with end bent toward left so that subsequent turns may fix it; thread drawn taut on far side, brought over snood and through hole from near side; all turns ascend on far side and descend on near side; first turns pass over bent short end (4) to fix it against side of head; two turns (5) drawn taut; third slack turn on left will complete covering of short end when thread (6) drawn taut. *b*, main part of lashing (5) completed with about ten turns which pass over snood without any turns around snood itself; thread from last turn brought up on far side and passing under snood to left of lashing (5) is carried horizontally to right over near part of lashing, passes under snood, and returns from right to left over far part of lashing; passes under snood and repeats circumferential turns (7) making three in all, braces lashing; thread (6) after last turn passes under snood. *c*, fixation of free end: thread to right of completed part and on far side of snood; series of close seizing turns (8) made; end may be fixed by couple of half-hitches, overhand knot with end also stoppered with overhand knot, or by turning end back under two or more loose turns subsequently drawn taut; slack removed by pulling end; thread cut off close (6) to seizing. *d*, lashing turns (5) through hole on both sides, circumferential turns (7) passing under snood and over hole turns on both sides; seizing (8) with fixed end (6).

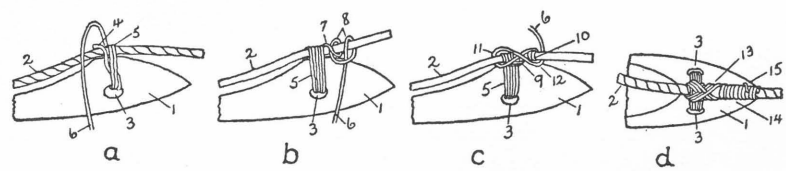


FIGURE 97. Bonito hook, complicated snood-head lashing: *a-c*, side views; *d*, top view. *a*, short end (4) fixed on near side of shank head (1) by overlapping turns (5) through hole (3) and over snood (2); in this hook end laid on snood; thread (6) passes through hole from near side. *b*, five simple turns made and next turn (7), coming up from hole on far side, makes two half-hitches (8) around snood on right of lashing (5); half-hitches drawn taut close to previous turns over snood and thread (6) completes turn by passing through hole from near side; two simple turns made and next two turns with two half-hitches around snood; seven more simple turns. *c*, three circumferential turns (9) made around lashing below snood but in this hook last ascending turn from far side brought over snood on left of lashing, passed back under it, and crossed horizontally over far lashing thus changing direction of circumferential turns from right to left on near side; after last circumferential turn, two half-hitches (10) made around snood on right of lashing (5); figure-of-eight turn on snood with one loop (11) to left of lashing, other loop (12) to right, and crossing in middle line above snood. *d*, two more figure-of-eight turns (13) made, each to right of preceding one, crossings thus form neat pattern on top of snood; thread continued with seizing turns (14) around snood on right and end (6) fixed under two turns.

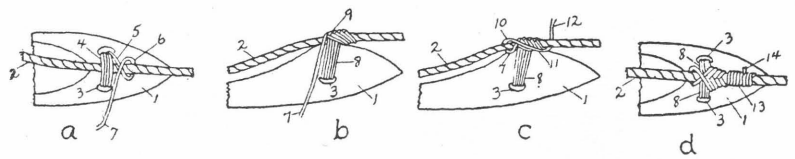


FIGURE 98. Bonito hook, neatest snood-head lashing: *a, d,* top views; *b, c,* side views. *a,* commencement end of thread hidden under four straight turns (4) through hole (3) of shank head (1) and over snood (2); next turn (5) on ascending from far side crosses over snood and makes turn (6) around snood, crossing over itself on snood in middle line to descend on near side (7) to pass through hole (3). *b,* first turn around snood (*a,* 6) well to right of previous lashing turns to enable subsequent turns to follow closely on left of first; each turn through hole ascends on far side, makes turn around snood, and passes through hole on near side; third turn takes extra turn around snood; six turns (8) in all made and crossings (9) above snood carefully made to form pattern; last turn finished with thread (7) on near side of snood. *c,* thread from last turn (7), instead of passing through hole, passes back under snood, makes turn (10) over it, and crosses diagonally (11) on near side to pass under snood on right of lashing; thread (12) brought to right of lashing for final fixation of free end. *d,* thread seized with close turns (13) around snood and end (14) fixed under three loose turns subsequently drawn taut.

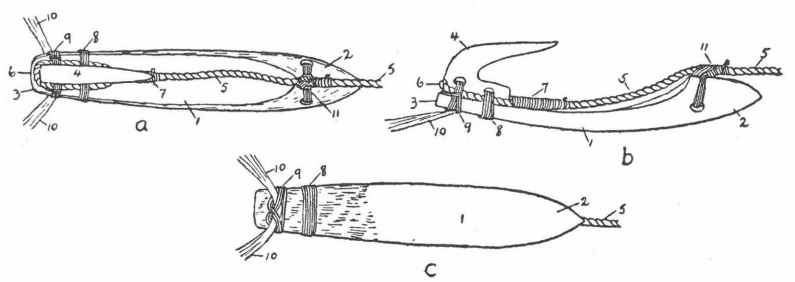


FIGURE 99. Bonito hook, complete lashing: *a,* top view; *b,* side view; *c,* back view. 1, shank; 2, head; 3, tail; 4, point with holes for lashings; 5, snood; 6, snood loop; 7, snood loop seizing; 8, proximal point lashing; 9, separate distal point lashing with side bindings in which thread passes from one side to other around back of point and under snood; 10, hackle; 11, head lashing.

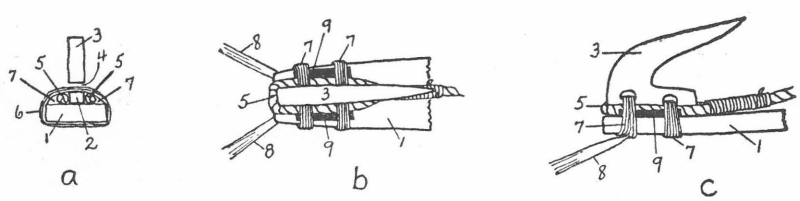


FIGURE 100. Bonito hook, filler sticks (*mono*): *a,* cross section through distal hole and lashing; *b,* top view; *c,* side view. 1, shank; 2, point below hole; 3, point above hole; 4, distal hole; 5, snood loop; 6, distal lashing; 7, *a,* spaces on outer side of snood loop and below lashing turns, which in thin point detract from firmness of lashing; 7, *b, c,* lashings; 8, hackle; 9, filler sticks of coconut leaf midrib pushed in under lashings and broken off short.

is used, but no filler sticks. Nordhoff, however, is correct as to the use of filler sticks when the point material is thin. In four hooks with filler sticks the point material consists of pearl shell which is only 3 mm. thick, whereas most of the other hooks are 4 mm. or 5 mm. thick. With a thin point, there is extra space left on the outer side of the snood loop under the lashings, and this space is filled up by the insertion of filler sticks (fig. 100). The sticks are used to tighten up the point (*kia whakaketa te kawiti*). Nordhoff's informant used *fakaketa* as the term for the sticks, whereas my informant used *mono* as the specific term and *whakaketa* as a verb denoting their function. Kennedy (16, p. 48) describes the use of wedges (*seketi*) in the Ellice Islands, also made of coconut leaflet midrib. The feature of the Manihiki filler sticks is that they are small and are broken off on the far edge of each of the two lashings. The Ellice Islands filler sticks are longer and extend for the full length of the base of the

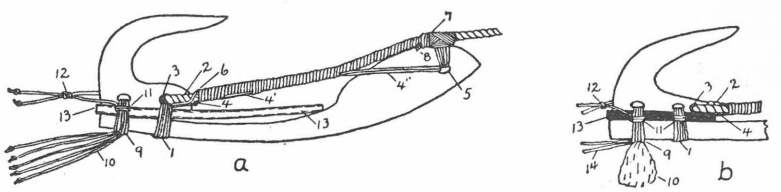


FIGURE 101. Filler sticks, Pukapukan and Ellice Islands bonito hooks. *a*, Pukapukan hook (Gerrit P. Wilder collection): point material is pearl shell; proximal lashing (1) and snood (2) pass through proximal hole (3); thread (4) tied through proximal hole makes turns through head hole (5); from last turn (6) through proximal hole, thread seized in close turns around snood and its previous turns through head hole for few turns; lower threads (4′) left out of seizing for short distance and then included again in seizing with snood; toward head, lower threads (4″) left out and seizing continued to above head hole; head lashing (7) completed and end (8) fixed with couple of overhead knots on left of lashing; distal lashing (9) of point fixes hackle (10) with oblique turns in Manihiki method (fig. 91); lashing thread, however, runs through hole to half way as in Samoan method (28, p. 500), and after number of turns with each half, ends form side bindings (11) around lashing on each side; ends carried back from sides, knotted together (12), and left long as part of hackle; hackle (10) consists of number of threads held together like Manihiki hackle, and oblique turns of distal lashing pass over its middle; filler sticks (13) 61 mm. long pass under both lashings; length of shank, 100 mm.; greatest width of head, 15 mm.; height of head, 15 mm.; width at tail, 8 mm.; length of point base, 24 mm.; point thickness, 3 mm. *b*, Ellice Islands hook (adapted from Kennedy, 16, p. 41): proximal lashing (1) passes through middle hole and snood loop (2) through proximal hole (3); lower threads (4) pass through head hole and are seized with snood for part of course as in Pukapukan and Samoan hooks; point lashings (1, 9) with side bindings (11) made in same way as in Samoa and Pukapuka; ends of distal lashing threads carried around back of point and lashed together (12); feather hackle (10) attached in Samoan method (28, p. 500) by open coil included under distal lashing; coils drawn taut over middle of hackle and ends (14), after being tied, left long as part of hackle; filler stick (13) thrust in under lashings and broken off to length of point base.

point (fig. 100, *b*). In Pukapuka filler sticks are also used, but they are much longer again and extend from the distal end of the point to the rise of the front of the shank to form the head (fig. 101). The need for filler sticks does not depend entirely on the thinness of the point, but also on its relation to the width of the tail end of the shank. In some of the Manihiki hooks with thin points the tail is correspondingly narrow, and no filler sticks were used. Whatever extra width the Manihiki shank tail may have is in most hooks compensated for by the snood loop, which passes around the point base and thus occupies most of the space under the lashing. It thus discharges the functions of the filler stick. This may have been one of the reasons for its adoption. In Ellice Islands and Pukapuka the snood does not pass under the lashings, and the need for filler sticks is thus obvious. Even with the Ellice Islands technique, filler sticks were not always needed, for Kennedy (16, p. 48) states, "In cases where the barb [point] is thick and has a good seat on the shell, the *seketi* [filler stick] may be omitted." In Samoa, where the snood passes through the proximal hole and the point lashings are similar to those of Pukapuka and Ellice Islands, the filler sticks are not used at all.

The drill (*hou*) resembles the Samoan pattern with a stem of *ngangie* wood, a circular wooden disc as a balance, and two strings attached above to a hole in the top of the stem and below to the two ends of a crossbar, which act as a handle. The handle does not come down as far as the disc. Most points (*mata*) consist of the long pointed shells (*vaevae unga*) inhabited by hermit crabs. No names for the parts could be given, nor were any proverbs or sayings remembered in connection with the drill.

The rod (*matira*) consists of a *tou* or *whano* pole 2 fathoms to 3 fathoms long. One line only is attached to each rod. The snood carrying the hook is tied to the end of the line with a reef knot, one end being looped when forming the second turn of the knot. The second turn is so made that the free end of the looped part points upward. It is then quickly grasped and pulled to undo the knot in changing the hook, should it prove unattractive to the fish. A piece of cord is tied around the butt end of the rod with a short loop to take the point of the hook when it is not being trolled.

The canoes used in bonito fishing are the modern plank canoes. No special rod rests are made on these canoes. The rod rest (*pou 'ofe*) is a feature of the Samoan bonito canoe and is also used in the canoes of Pukapuka and Ellice Islands. In trolling, the rod butt fits against the back of the aft seat and is held by the rest at the appropriate angle. The fisherman thus has his arms freed for paddling, and the notice that a bonito has taken the hook is given by the forward leverage of the butt, the rod rest acting as

a fulcrum. The fisherman has his back to the rod, as he is facing forward while paddling. He sits against the rod and the movement of the butt end indicates that a fish is caught. The fisherman reaches around with his right hand, seizes the rod, lifts it toward him, and swings it around on the right side to land the fish in the canoe. This detail is the characteristic feature of a western Polynesian technique which evidently has Pukapuka as its eastern limit of diffusion. In Manihiki, Rakahanga, and Tongareva, the absence of the mechanical rod rest leads to a totally different method of fishing:

> The fisherman sits on the aft seat facing the stern and therefore cannot paddle while on the fishing ground. He holds the butt of the rod between his thighs, usually at an angle so that it is below one thigh and over the other, to give it support. He holds the rod at the angle required and feels the direct pull of the fish with his hands primarily. When a fish is hooked, the fisherman swings the fish directly toward his breast and when it is near enough, he strikes the fish a horizontal glancing blow with the outer edge of his left palm, causing the body to jerk upward. This action, correctly applied, disengages the fish from the hook so that it drops into the canoe. Experience and judgment are required to swing the fish in at the right angle and level. The inexpert fisherman from some other island often swings the fish too high so that it strikes him on the face, to the intense enjoyment of the local experts. Most canoes are built for two, so that while the expert fisherman uses the rod facing astern, the assistant in the forward seat plies the paddle to keep the canoe moving.

The method of bonito fishing is thus distinct from that of western Polynesia. The Manihikian method resembles that of Society Islands, as described in detail by Nordhoff (21, p. 252). Presumably the same method is observed in the Tuamotus and the Marquesas. A Hawaiian fisherman demonstrated a similar method to me.

Manihikian colonists catch the bonito in Rarotongan waters with their own pearl-shell hooks. There was no bonito hook in Rarotongan culture.

BONITO HOOKS, COMPARATIVE STUDY

Nordhoff (21, p. 233) has referred to the varieties of bonito hooks being spread from the Tuamotus to New Guinea, and from New Zealand to the Carolines, Marshall Islands, and Hawaii. He suggests dividing them into two broad categories, the Melanesian type with the snood attached directly and to the head of the shank alone, and the Polynesian type with the snood attached directly to the point, and secondarily to the head by a lashing of fine thread. The Micronesian hooks come under the Melanesian type in this general category, but there are some outstanding differences between them, as exemplified by the Melanesian hooks of Solomon Islands and the Micronesian hooks of Marshall Islands.

The Melanesian hooks of Solomon Islands have shanks of pearl shell cut radially through the hinge with the thick hinge part shaped to a raised

triangular knob to give support to the snood lashing. The points are made of turtle shell and are definitely more curved in toward the shank than either the Micronesian or Polynesian points. The base of the point is prolonged distally to take a second lashing either over the projection or through a hole. (See fig. 102, *a-c.*)

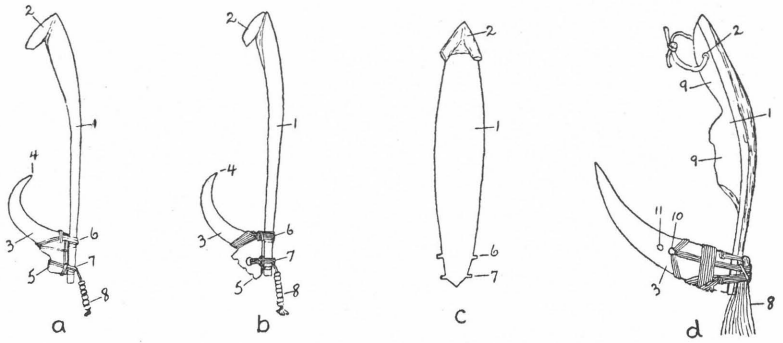


FIGURE 102. Melanesian and Micronesian bonito hooks: *a-c,* Solomon Islands hooks; *d,* Marshall Islands hook. *a,* hinge part of slender shank (1) forms head, worked into projecting knob (2) on front; point (3) has marked incurve to functional point (4) and distal projection (5) at base; one shank lashing (6) of point passes obliquely over slight nick in point, other (7) over distal projection; hackle (8) of beads, post-European adaptation. *b,* similar slender shank (1) with head knob (2); point (3) has similar incurved point (4) but distal projection (5) much deeper, forming upper acute angle with point limb, and back edge oblique instead of vertical; oblique back edge serrated for ornamentation; hole bored through large distal projection; one lashing (6) over high upper angle of distal projection, other (7) through hole in projection. *c,* shank, front view: shank (1) shows somewhat triangular knob (2) formed from hinge on front surface, with base grooved to form bifurcation; knob supports snood lashing and snood has no connection with point; tail end of shank which supports point has two paired lateral projections (6, 7); two lashings of point pass around shank on head side of these projections, which prevent lashings from slipping back over narrowing tail end. *d,* Micronesian hook: thick shank (1) with projection (9) on front formed by raised hinge and transverse hole (2) bored through projection of hinge at head end; long point (3) has no incurve and is simple without any projections at base; hole (10) bored through point limb to take lashing which is more complicated than in Melanesian hooks; another hole (11) pierced through above but does not function in lashing; hackle (8) cut off but is very large and long, composed of strips of bark bast; paired lateral projections at tail end prevent point lashings from slipping back.

The Micronesian hooks of Marshall Islands are larger in both shank and point. The shank is rough and wide, formed from a section cut along the hinge. The head end is not artifically shaped, but a transverse hole is bored through the natural projecting part of the hinge to take the snood lashing. The point of pearl shell is very long, without any incurve, and is pierced by a hole to take the shank lashing. The point may be termed a simple point, as it has no projections at the base, either distal or proximal. (See fig. 102, *d.*)

Another point of resemblance between the Melanesian and Micronesian hooks, in addition to the lack of attachment of snood to point, is the presence of paired lateral projections on the shank to assist the shank-point lashings. The main differences between the two types are as follows:

	MELANESIAN	MICRONESIAN
Shank	Section radially through the hinge	Section along the hinge
Snood attachment	Shaped triangular knob	Transverse hole through natural hinge
Point material	Turtle shell	Pearl shell
Point type	Incurved	Not incurved
Base projection	Distal	None

The shank is remarkably homogeneous over the whole Polynesian area. The shell is cut radially through the hinge as in the Melanesian types, but the treatment of the thick hinge part is different. The hinge part is ground inward from the sides to form a raised median edge on the front. Contrast figure 86 with figure 102, *c*. A transverse hole is bored through below the mesial edge, a treatment which resembles the Micronesian. Compare figure 87 with figure 102, *d*. Instead of the paired lateral projections of the Melanesian and Micronesian shanks to assist the shank-point lashings, the Polynesians adopted the opposite technique of cutting paired grooves. It seems plausible to suppose that the Polynesians used the more easily made grooves because the point received forward support from the attachment of snood to point. An exception to the general Polynesian usage with paired grooves is found in some Hawaiian hooks with paired projections. These exceptional hooks, however, may have been due to Micronesian contacts in post-missionary times.

The Polynesian point, however, underwent differentiation through the provision for a second shank-point lashing. The problem was met by increasing the width of the base of the point. It was evidently thought undesirable or too unwieldy to continue the inner and outer curvatures of the point limb to form a wide base and so retain the simple form of the Micronesian point. The extra width of the base was provided by a projection on either the distal side away from, or the proximal side toward, the head. From the side on which the projections are made, the points divide into two main types which from their distribution may be termed eastern and western types.

The simplest form of point, which is without either projection, is the Hawaiian. The Hawaiian point has the simple Micronesian form but is made of bone and is less massive. It is pierced by one hole which takes the single shank-point lashing and also a secondary hackle lashing. In addition, however, the single hole takes the snood, which gives it forward support, the snood between the point and the lashing with the head appearing more taut than in hooks from other areas which have two shank-point lash-

ings. In two hooks in Bernice P. Bishop Museum the points have slight distal projections at the point bases which do not function but are either purely ornamental or vestigial. (See figure 103, *a-b.*) From figure 103 it would appear that the Hawaiian point is insecure, for there is but one real lashing to the shank. The point may be moved about by the fingers, but it cannot be pulled off, for the snood is taut. The slight distal projection shows the direction in which improvement could have proceeded to provide room for a second lashing.

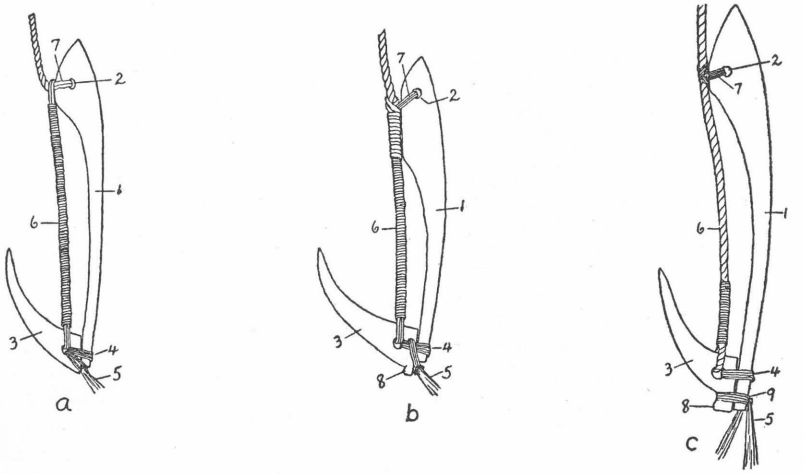


FIGURE 103. Eastern Polynesian bonito hooks: *a,* Hawaiian simple point; *b,* Hawaiian point, slight distal projection; *c,* Tahitian point, typical distal projection. *a,* typical shank (1), head pierced by transverse hole (2); point (3) simple with one hole; one shank-point lashing (4) through point hole, and hackle (5) with lashing through hole; snood (6) attached directly to point through point hole, seized as far as head, attached to head by snood lashing (7) through head hole. *b,* shank (1) with rather long head with transverse hole (2); point (3) with small distal projection (8) which, however, is without function in lashing; one hole; one shank-point lashing (4) through point hole but with hackle (5) lashed around shank-point lashing; snood (6) attached directly to point hole, seized as far as head, attached by snood lashing (7) to head hole. *c,* shank (1) with typical head with transverse hole (2); point (3) with one hole and prolonged distal projection (8); two shank-point lashings, proximal (4) through point hole and distal (9) over groove in distal projection; hackle (5) fixed by some turns of distal shank-point lashing; snood (6) attached directly to point through hole; seized for part distance, attached to head through hole by snood lashing (7).

The eastern type of point is typically exemplified by the Tahitian hook in which the slight distal knob of the Hawaiian point is enlarged to form a functioning distal projection over which a second lashing is made to fix the point more securely and immovably to the shank. (See fig. 103, *c.*)

A further development of the Tahitian point is seen in Marquesan hooks figured by Beasley (1, p. 14, pl. 76) and Linton (18, pl. 71, *B,* 1, 3). Here the distal projection is pierced with a second hole and the second shank-

point lashing passes through the hole instead of over the projection. The gradation of the eastern point is shown in figure 104. A result of the more

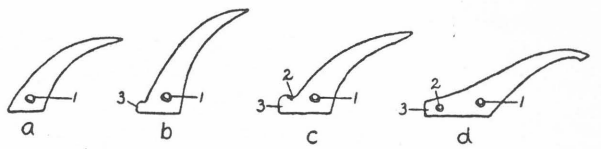


FIGURE 104. Eastern types of bonito hook points: *a*, simple point of Hawaiian hook (fig. 103, *a*) with one hole (1) and no projections; *b*, Hawaiian point (fig. 103, *b*) with one hole (1) and slight distal projection (3) which does not function in lashing; *c*, Tahitian point with wider base formed by distal projection (3) with groove (2) for lashing; *d*, Marquesan point with hole (1) through point limb and distal prolongation (3) through which second hole (2) pierced for second lashing.

secure fixation of the point by two lashings is that the snood between the point and the head is not so taut as in the Hawaiian hook with a single lashing. The eastern type of point is found in Society Islands, the Tuamotus, and the Marquesas. The Hawaiian type has more affinity with the eastern than with the western type. The Tahitian type with one hole has spread into the Marquesas, where it is found in addition to the two-hole type. It has also spread into the Tuamotus, with the exception of Fagatau. The Tahitian type with the distal projection resembles the Melanesian type in figure 102, *a*, but differs in providing a hole for the proximal shank-point lashing. Note that the hole in the Melanesian point (fig. 102, *b*) is through the distal projection and is intended to carry the distal shank-point lashing.

The western type of point is characterized by the prolongation for a second shank-point lashing on the proximal end of the point base. The form has been exemplified by the Manihiki-Rakahangan hooks. It is also illustrated by some points from Fanning Island, discovered in an old tomb made by inhabitants who disappeared before European discovery. The age of the relic is proved by the fact that the typical Polynesian shanks found with them showed that the holes through the heads were pierced from either side with an old-time drill point making two funnel-shaped holes which met in the middle. In the simplest form of Fanning Island point (fig. 105, *a*) the point is large and has a correspondingly wide base. In spite of the extra width, it was not feasible to pierce a second hole through the base without increasing its width a little. This slight increase was provided by prolonging the base proximally, a method opposite in principle to that of the eastern type of point. In the smaller points, the proximal prolongation was increased in order to provide sufficient base width without rendering the point limb disproportionately wide. The principle of retaining the original hole through the base of the point limb and piercing a second hole through the proximal prolongation therefore became established.

It is quite probable that originally the proximal prolongation was grooved instead of pierced. This happens accidentally in some Tongarevan points and occasionally in Manihiki hooks (fig. 88, *d*) in which, owing to the insufficient depth of the prolongation, the pierced second hole breaks through above and forms a groove which is just as efficient as a hole for lashing purposes. The grooved proximal prolongation happily survives in Fagatau in the Tuamotus, where it has been located by K. P. Emory. The points in use at the present time are made of turtle shell (*una*) with one hole drilled through the point limb and a groove over the proximal prolongation. Though pig's hair is sometimes used for the hackle, the most common material consists of man-of-war hawk feathers, which, after being fixed to the shank, are cut off short on either side. The feather hackle and form of the point

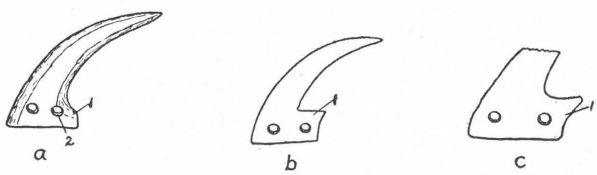


FIGURE 105. Fanning Island bonito hook points, western type. *a*, perfect point: base with slight proximal prolongation (1) to enable two holes to be pierced through base; curvatures of hook ground on either side to sharp edge; grinding on lesser curvature comes down on line of proximal hole (2) which would be seriously weakened but for proximal prolongation (1); length of base, 24 mm.; distance from point to distal end of base, 63 mm. *b*, perfect point: marked proximal prolongation (1) increasing length of base to 22 mm.; proximal hole bored through prolongation; distance from point to distal end of base, 53 mm. *c*, broken point: marked proximal prolongation (1) making base 31 mm. long; diameter of large holes, 6 mm.; depth of prolongation, 14 mm.

made it possible more correctly to attribute to Fagatau two hooks from the Young collection in Bernice P. Bishop Museum loosely labeled "Society Islands." These hooks were collected many years ago and show a still earlier form of Fagatau point in which there was no hole. Both shank-point lashings passed over the proximal prolongation. (See fig. 106.)

Even without the history of the two hooks, the use of horsehair or pig's hair for the hackle instead of feathers and the employment of the needle and grooves in fixing the hackle instead of figure-of-eight turns show that hook *b* is more modern than hook *a*, and it follows that the use of the single hole through the point is also a more modern development on Fagatau. The needle and groove method of attaching the hackle has spread to Fagatau from Tahiti and probably also to Manihiki and Rakahanga from the same center.

A gradation of the western type of point is shown in figure 107, in which the order *a, b, c* is natural. A point like *b* was found on Fanning

Island, but the simple form of *a* was large, with a naturally wide base. The forms *b* and *c* occur together and *c* is merely a specialization of *b*. The simplest point, however, is *f*, without holes and thus readily made without the use of a drill. Point *e* has recently developed from *f* as a result of Tahitian influence, and it necessitated the use of the drill. It has one hole probably because the Tahitian point has only one hole, the second lashing passing over the distal prolongation. The Fagatau people have copied the one hole and retained the proximal lashing over the proximal prolongation.

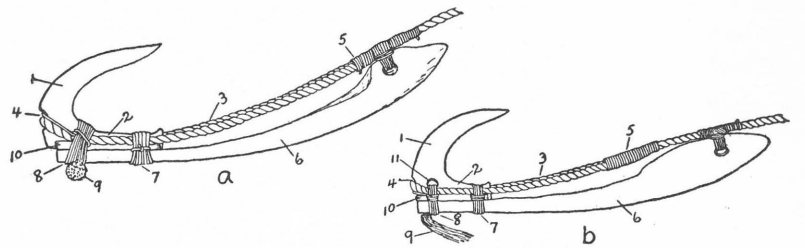


FIGURE 106. Fagatau bonito hooks: *a*, older form (B. P. Bishop Mus., Young Coll.); *b*, modern hook. *a*, point (1) has long proximal prolongation (2) and no hole; snood (3) incloses base of point, end passes through groove (4) on distal end of point; proximal end of loop seized by lashing (5) close to head of shank (6); proximal (7) and distal (8) shank-point lashings pass over proximal prolongation; feather hackle (9) fixed to under surface of shank by figure-of-eight turns of distal lashing in method similar to Manihiki fixation (fig. 91); filler sticks (10) of coconut leaf midrib below lashings on either side; point base projects distally beyond end of shank tail to bring point bend back into suitable position for distal shank-point lashing. *b*, point (1) has unperforated proximal prolongation (2) but part corresonding with point limb pierced by hole (11); long snood loop (3) passes around groove (4) on back of point; seizing lashing (5) which closes loop is further from head than in *a*; proximal shank-point lashing (7) passes over proximal prolongation (2); distal lashing (8) passes through hole (11) in point, thus point does not project so far back over tail end of shank (6); filler sticks (10); hackle (9) of horsehair lashed to distal lashing (8) by means of transverse turns passing through grooves made on back of shank with file; steel needle used as in modern hackle attachments of Manihiki (fig. 95) and Tahiti.

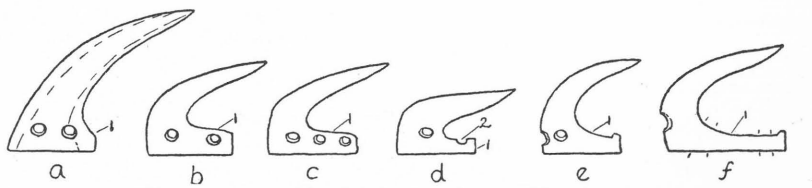


FIGURE 107. Western type of bonito hook point: *a*, Fanning Island, slight proximal projection (1) and two holes; *b*, Manihiki, marked proximal projection (1) to carry second hole; *c*, Manihiki, proximal projection (1) carrying second and third holes, separate hole thus provided for snood which passes through it instead of being looped around base of point, exceptional and follows Samoan and western alternative method; *d*, Tongareva, broken hole (2) through proximal projection (1) forming groove for second lashing; *e*, Fagatau, modern, one hole and proximal projection (1) trimmed for second lashing; *f*, Fagatau, old, no hole, both lashings pass over lengthened proximal projection (1).

It requires little imagination to realize that with the continued use of the drill a second hole might be pierced in the proximal prolongation and thus make the Fagatau one-hole point (*e*) conform to the pattern of the two-hole point (*b*). It seems reasonable to suppose that the points *f* and *e* represent the original stages in the development of the general type *b*.

The western type of point with two holes is found in Tonga, Samoa, Ellice Islands, Tokelau, Pukapuka, Manihiki, Rakahanga, and Tongareva. The distribution gives it a western origin. The primitive form with no holes is found in Fagatau in the Tuamotus and thus forms an outlier as far as this cultural element is concerned. The two-hole point with a proximal prolongation figured by Beasley (1, p. 13) and labeled "Danger Island, Paumotus" should be referred to Pukapuka in the northern Cook Islands. Pukapuka in the Tuamotus (Paumotus) has not been inhabited for some generations.

The main differences between the eastern and western types of point may be summarized as follows:

	EASTERN	WESTERN
Uninterrupted curvature	Proximal	Distal
Projection of base	Distal	Proximal
Treatment of projection	Upper groove common, hole confined to one area (Marquesas)	Pierced hole common, upper groove rare (Fagatau)
Number of holes	One, sometimes two	Two, sometimes three; one confined to Fagatau

The western type may be divided into two divisions according to the method of attaching the snood to the point. From the western limits of Polynesia as far east as Pukapuka, the snood is attached to a hole in the base of the point. In the eastern part of the area in which the western point is found, the snood is formed into a loop which passes around the base of the point, as seen in Manihiki, Rakahanga, Tongareva, and Fagatau.

WAR AND WEAPONS

Warfare

The traditional narratives available do not record any wars. As the people lived in one village in Rakahanga and two in Manihiki, instead of separating to the various islands, the contention that active fighting of a serious nature was unknown is feasible. At the same time, individual and family disputes must have occurred, for certain people were referred to as *toa* (warriors) who were armed. It was evidently their duty to enforce the keeping of tapus and prohibitions concerning food-producing islands that were closed to enable crops to recover. The weapons consisted of spears and two forms of clubs.

Spears

The spear (*tokotoko*) was made of coconut wood and was from 2.5 arm spans to 3 arm spans long. The distal end had a sharp, rounded point (*mata*), and the proximal end had a raised butt flange to prevent the back hand from slipping off. A modern spear obtained on Rakahanga is shown in figure 108, *a*. Edge-Partington (6, vol. 1, p. 62, fig. 7) figures a Manihiki spear 89 inches long, inlaid with pearl shell discs, and with a four-sided point. The weapon was primarily used for piercing with a thrust (*wero*) but could also be used for striking (*rutu*).

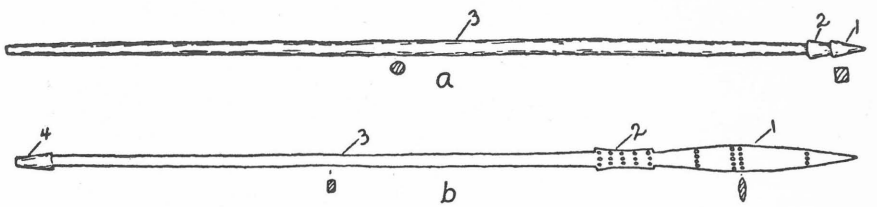


Figure 108. Weapons: *a*, spear (*tokotoko*); *b*, long club (*korare*). *a*, spear, 8 feet 8 inches long: 1, four-sided pyramidal point, 4.1 inches long, 1.5 inches wide at base; 2, second pyramidal projection, 2.6 inches long, 1.6 inches wide on two opposite sides of base and 1.5 inches wide on other opposite sides, narrow part at base of first point is 1 inch in all diameters; 3, shaft, diameter at rounded base of second projection is 1.1 inches, maximum diameter about 1 foot from junction is 1.4 inches, diameter 2 feet from proximal end is 1.2 inches, cross diameters at end are 0.8 inch by 0.6 inch, shaft not perfectly round, difference of 0.05 inch to 0.1 inch in some cross diameters. *b*, club, 8 feet 5 inches long: 1, blade inlaid with double rows of circular pearl-shell discs with single row about midway to shaft and another toward tip, lateral edges sharp, blade is 2 feet 1 inch long, maximum width 1 foot 3 inches from pointed tip is 2.4 inches, where thickness is 0.7 inch, blade is 1.4 inches wide at junction with shoulder; 2, shoulder ornamented with five rows of pearl-shell discs and five pearl-shell discs on sides corresponding in line with rows on upper and lower surfaces, prolonged like cuff for 6.5 inches, 2 inches wide at each end, 1.5 inches wide in middle, 0.6 inch thick; 3, shaft, 5 feet 6 inches long, 1.2 inches wide in middle, 0.85 inch thick, somewhat rectangular in cross section; 4, proximal butt, 4 inches long, 1.4 inches wide at shaft junction, 0.9 inch wide at end.

Clubs

Clubs (*korare*) were of two forms, long and short. The long club was made of coconut wood. It was described as being *tukerua* (two *tuke*) long. A *tuke* is the distance from the outstretched hand to the opposite shoulder. A long slender *korare* seen at Rakahanga is shown in figure 108, *b*. A club like a long billet with the head end rounded and slightly expanded (pl. 10, *B*) is richly inlaid with pearl-shell discs throughout its length.

The short *korare* was made of *tou* wood and was less than one *tuke* long. It had an expanded thick blade with sharp edges. One form described to me was said to have a curved distal end something like a bill hook, as in figure 109, *a*. The *korare* made for me has no curve as in figure 109, *b* and plate 10, *A*. A much shorter club fully inlaid (fig. 109, *c*) was recorded by Edge-Partington (6, vol, 2, p. 21, fig. 1). The short *korare* was sometimes carried slung to the wrist for use at close quarters.

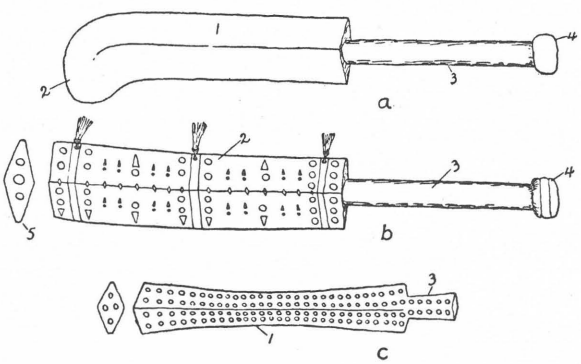


FIGURE 109. Weapons, short clubs (*korare*). *a*, Rakahangan club (drawn by F. Murray): 1, expanded blade, sharpened lateral edges do not meet in mesial edge; 2, curved end; 3, rounded shaft or handle; 4, proximal knob. *b*, Rakahangan club (C. 3019) of *tou* wood, 33.5 inches long: 2, blade with square end, ornamented with pearl-shell discs and triangles, incised along mesial edge with smaller circles, triangles, and nicks, 19.5 inches long, 4.2 inches wide at shaft junction and 4.9 inches wide at distal end, 1.9 inches thick between mesial edges, side edges blunt, abrupt shoulder at shaft junction; 3, shaft, 14 inches long, diameter is 1.5 inches; 4, proximal knob, 1.7 inches thick, transverse diameter is 2.4 inches; 5, end in section, with pearl-shell discs. *c*, short club (after Edge-Partington), 19 inches long: 1, blade narrower in middle and covered by four rows of pearl-shell discs; 3, short handle without knob.

RECREATIONS

PLAY

Tops of the general sharp-pointed cone type are made of *ngangie* wood. They are spun by having pieces of two-ply twisted sennit cord wound around them for a number of turns and being either thrown down or jerked sideways.

Stilts (*rore*) are made as in Cook Islands (27, p. 329) with steps lashed to straight poles. They are used in a fighting game (*tamaki*) in which opponents try to knock each other over by striking stilt against stilt. Stilts are also said to be used in stealing, to prevent footprints from being seen.

Darts (*to*) are made of lengths of coconut leaf midrib (*whani*) about 6 feet long, trimmed to a width of about 1.5 inches, with the fore end blunt-

pointed and the other end square to give purchase to the right forefinger. The dart, which is long and heavier than the darts of Cook Islands (27, p. 335), is held by two hands. The left hand supports the weight, and the right hand gives the propulsive force. The act of throwing is termed *toto* and the dart itself, *to,* which is a departure from the eastern Polynesian term, *teka.* There are two methods of throwing darts:

1. The *whakapa* method of throwing consists of taking a run and then casting the dart forward with a low trajectory so that it strikes the ground some short distance away and then runs along the ground. The dart does not rise like the light darts which are ricocheted off the ground close to the player and make long flights in the air.
2. The *hehe* method consists of casting the dart with a higher trajectory so that it goes as far in the air as possible and finishes up with a short course on the ground.

The dart-throwing competition is for distance. The site is the village road, and any number of competitors, children, youths, and adults, join in the play. The players cast in turn from a mark on the road, and the farthest dart scores a point. The players then walk up to the other end, pick up their own darts, and throw back again. Organized games between sides, in the demonstrations I saw, were not indulged in. The players simply threw darts back and forth for exercise and enjoyment, and the victor of each throw acclaimed himself. The throws did not go so far as the light darts of other areas, but the general average for distance was more certain.

The common Polynesian term *teka* has been applied to a game of jumping over coconut leaves laid on the ground. Hence, anyone stepping over another person is likened to a person playing *teka.* To step over another person is regarded as bad manners in many parts of Polynesia, and in Rakahanga disapproval is expressed in the phrase, "E aha koe, teka mai ai?" (Why have you come in *teka* fashion?)

String figures (*whai*) were known, but none were recorded by me. K. P. Emory saw a Manihikan in Tahiti set up a figure to the chant used by Maui on fishing up Rakahanga, "Tokomiti, tokomiti, tokoheta, tokoheta."

Dances

Of all the islands in the political boundaries of Cook Islands, Manihiki and Rakahanga have kept up to a greater extent the form of dancing usually referred to as a *tarekareka,* which corresponds to the *saka* of Tongareva (29, p. 78). As in Tongareva, the performers are arranged in columns of fours, men and women alternating in each four. The time is given by an orchestra beating wooden gongs and usually one large modern drum covered with goatskin. In the dance various movements of hands, feet, and bodies are executed in perfect unison, a marked feature being the quivering of the

bent knees and the lateral swaying of the hips. A series of different numbers follow in succession, a modern note being now introduced by a ballet master with a metal whistle to enforce commands which are issued as changes of movement are called. The dance is graceful and pleasing, but at times so fast as to partake of the nature of mere physical exercise. The dance does not attempt to express the virility of movement of the New Zealand *haka,* which is danced in rank and not in column. No voice accompaniment is used by the performers, due no doubt to the fact that time is given by the wooden gongs. Rehearsals are held beforehand under the direction of one who is appointed as ballet master. The movements of the various figures are arranged and practiced and their order of sequence decided upon. The figures are now usually named and the ballet master calls them out during the performance. The dances are given for the entertainment of visitors by the younger adults, who enjoy the performances as much as do their guests. The dance gives youth an opportunity of displaying grace and agility, and skill arouses admiration and applause.

Drama

The drama is represented by historical pageants (*nuku*). The stage, for most plays, is the village street. An orchestra of wooden gongs and the inevitable goatskin drum is provided, and a chorus may sing songs which describe the main events of the drama. A certain amount of make-up is used by the actors. The stage properties are necessarily of the crudest description. The actual words used by historical ancestors are recited at the appropriate time by the actors, but most of the play is represented in dumb show much after the principle of Chinese plays. The village humorist usually has a part, and by his exaggerated actions arouses much laughter among the audience. The person who thinks out the representation of the historical incident is credited as the author of the play, and it is customary to get his assistance or consent before reënacting the pageant on subsequent occasions.

A *nuku* seen at Rakahanga represented the mythical origin of the atoll (see p. 14) and is described in detail to give some idea of the method of presenting a *nuku.* The play took place in the afternoon. The street was cleared. The guests of honor were seated on the veranda of the chief's house, while the orchestra and chorus took up their position in the open court house opposite. The expectant audience lined the street on both sides in our immediate neighborhood. A small coconut leaf basket was placed bottom upwards in the middle of the street stage. The audience, which had seen the play before, glanced in the direction of an old, roofless lime house that stood about 20 yards down the street on our right and evidently formed

a screen for the leading actor. We followed the general gaze and were rewarded by the sight of Huku, the Discoverer, paddling his canoe around the corner into the main street, which represented the South Pacific Ocean. The canoe was formed of a 6-foot length of coconut leaf split down the midrib and plaited in the same manner as two roof sheets. With the midrib strips uppermost to form the canoe gunwales, a sheet was placed on either side of Huku's waist and tied in front and back so that the ends projected fore and aft to represent the bow and stern of his canoe. To prevent the canoe from slipping down, a loop of bast tied to the gunwales before and behind was passed over one shoulder. Huku was naked except for a loin cloth, while his entire body and face had been plastered with a greyish mud which served as grease paint. Around his head he wore a turban made from a piece of old fishing net. He wore whiskers, beard, and mustache made of coconut husk fiber. The make-up formed an effective disguise. (See pl. 11, *C*.) Huku's appearance, with the husk mustaches projecting at abnormal angles and the eyelashes caked with dry mud, was appreciatively welcomed with bursts of laughter. Stuck through the leaves of the canoe was a short fishing rod, with a curved strip of coconut husk dangling from the end of the line to represent both hook and bait. Huku's mud-painted legs projected down through the bottom of the canoe and supplied the real motor power as he wielded a canoe paddle to propel his canoe toward the middle of the stage. Now and again he ceased paddling to make casts with his ludicrous fishing rod, for his expedition was for the purpose of fishing. The progress of the canoe was varied by encounters with imaginary Pacific rollers, during which the bow of the canoe rose to dizzy heights and fell into deep troughs. As the canoe approached, the orchestra struck up a rhythm, and the chorus of men and women sitting grouped together burst into song.

Te kapua anga ia Rakahanga i te puka mari kongakore o tahito.
E tangata o Huku no Rarotonga mai e tere tautai na te moana.

The taking form of Rakahanga according to the tradition of ancient times.
There was a man named Huku from Rarotonga, who came on a fishing expedition out on the ocean.

The rhythm of the music affected the legs that stuck through the bottom of the canoe and they performed a grotesque dance on the bottom of the Pacific ocean, to the intense delight of the audience. By this time Huku had arrived near the basket in the middle of the stage. He bent over the side of his canoe and, peering down into the depths of the ocean, scrutinized the object. "Ah," said he, "this is an upgrowth of land." Again the chorus burst into song.

Titiro iho Huku e tapua ua te whenua.	Huku gazed down, the land was but forming.
Kua hoki o Huku ki Rarotonga.	Huku returned to Rarotonga.

Huku turned his canoe about and paddled off toward the dilapidated house which represented Rarotonga. On his way he evidently encountered a hurricane, for the bow of the canoe rose to alarming heights, and Huku even fell to the ground, where he kicked spasmodically, thus representing a canoe wallowing in the trough of high seas. At times we thought he was gone, for he had hardly enough strength to rise and surmount the next wave, but eventually, after a realistic exhibition, he passed through the gale and landed at Rarotonga.

For the second act, a stage hand roughly erected some coconut leaves on our side of the stage to represent a house. A small girl, covered with frayed mats and lauhala strips to represent an old woman, came in and took possession of the house. She was Hina-i-te-papa who dwelt at the bottom of the sea and evidently had power over fish. All eyes now turned toward an object on our left. Another coconut leaf canoe, paddled by an occupant also plastered with grey mud, emerged from behind a house. This was the mischievous culture hero of Polynesia, known in Rakahanga as Maui-muri. Paddling to the middle of the stage, he unloosened his canoe, stepped out of it, and with outspread arms took a realistic header onto the floor of the ocean. He crawled along on his hands and knees to the house of Hina-i-te-papa, and a modern note was introduced when he knocked with his knuckles against the midrib of one of the coconut leaves. He then proceeded to instruct Hina as to what she had to do when he and his brothers came fishing next day. He crawled back to his canoe, assumed the erect position, tied his canoe to himself, and paddled off. A few seconds later, a very large coconut leaf canoe emerged from behind the corner of the house. Three men were strapped to the canoe, the one in the stern being Maui-muri. Each had a short fishing line with a *Ruvettus* hook attached to it and stuck in his waist cloth. As the voyagers approached the stage the chorus broke out,

E waka tautai teia no nga Maui e teru.	This is a fishing canoe belonging to the three Mauis.
Rira rirari lalalala. Ko te Pipimahakohako te ingoa o taua waka nei.	*Rira rirari lalalala.* The Pipimahakohako is the name of that canoe.
E tere tautai to ratou; na te matangi rai i hapai atu, etae atu ra ki te Tukunga i Whakahotu.	A fishing expedition is theirs; the wind will bear them along to reach the fishing ground at Whakahotu.
Maui-muri atea pou i raro i te moana	Maui-muri, beforehand go down into the ocean,
Tena o Hina-i-te-papa tei raro i te moana, tei whakatika mai i tahau i pati atu.	There is Hina-i-te-papa below the sea, to grant that which you ask for.

It will be noticed that the third verse is put into the present tense in continuous narrative form, though Maui-muri had already sought out Hina-i-te-papa. The fishing incidents described on pages 14-15 were then acted. As Maui-mua, in the bow of the canoe, dropped his hook, the chorus sang,

Maui-mua tautea to matau; tukua to matau kia kai mai te ika i raro i Hawaiki.	O Maui-mua, prepare your hook; drop your hook that the fish below in Hawaiki may bite.

Hina-i-te-papa, who was supposed to be invisible from her position at the bottom of the sea, seized the hook, stuck it into a small immature coconut, and pulled on the line. Maui-mua shouted with glee and asked his brothers to guess the name of the fish he had hooked. Maui-muri replied that it was a shark. The chorus epitomized the incident in song:

Kua mou e, mou mai te mango ki runga i te matau. Kia pateretere te merete.	It is caught, the shark is caught on the hook. (Refrain).
Ka huti huti hutia ki runga; ka pate pate pateretere. Kua kai tero patere.	Haul, haul, haul it up. (Refrain).
Mango tena. E taravini teraravini mei te titiraina.	It is a shark. (Refrain).

The second Maui brother let his hook down and the chorus sang,

Maui-roto e tautea to matau, e tukua to matau kia kai mai te ika i raro i Hawaiki.	O Maui-roto, prepare your hook; let down your hook that the fish below in Hawaiki may bite.

Hina-i-te-papa stuck the hook into another immature coconut, which represented an *urua* fish. As the hook was pulled, Maui-roto shouted with glee and asked the question, which was correctly answered by Maui-muri. The chorus sang a similar song regarding the hooking and hauling up of the fish, and *urua* was substituted for *mango* in the song.

The hook of Maui-muri baited with a small green branch of *puka,* a piece of coconut husk, and an immature, small nut was let down, to the song by the chorus. Hina-i-te-papa, according to agreement, hooked it into the rock, represented by a large coconut. The chorus sang,

Kua mou e, mou mai Hawaiki ki runga i te matau. Kia pateretere te merete.	It is caught, Hawaiki is caught on the hook. (Refrain).
Ka huti, etc.	

The coconut was brought up with much straining. As it appeared on the canoe, Maui-muri stepped off onto what was supposed to be dry land, while his brothers fell off the canoe and crawled away, to show that they had been engulfed in the ocean.

Maui-muri then recited with appropriate hand and foot action a *kapa.* Hina-i-te-papa, presumably at the bottom of the sea, also recited a *kapa*:

Torireto! Paoa mai te rangi,	The heavens crash,
Mimiti mai te wai,	The waters recede,
Hohoro mai te wai, torireto.	The waters surge.

The stage was then cleared for the third act.

In the third act Huku paddled over from Rarotonga, saw the land, and planted a coconut in the road. The chorus epitomized the scene as follows:

Aro mai Huku mei Rarotonga	Huku came from Rarotonga,
Tere tautai ika na te moana e.	On a fishing expedition at sea.
Pakia ai koe e te kare o te moana.	You will be beaten by the sea-spray.
Tirotiro Huku e kua ha te whenua.	Huku gazed about and saw the land was bare.
Kua tanu aia i te hakari,	He planted a coconut,
Kua tapa aia i tona ingoa ko te Huru-awatea.	He named it the Huru-awatea.
Kua hoki aia ki Rarotonga.	He has returned to Rarotonga.

The fourth act opened with Huku basking in the sun, leaning against the wall of the ruined house. Another character, Wheatu, appeared and also sat against the wall not far from Huku. Huku, daydreaming, repeated the historic words:

> Oa, tera pa te Huru-awatea te tahirihiri mai ra i te Maru-o-araiawa.
> Ah—perhaps the Huru-awatea is waving its fronds in the Shade-of-Araiawa.

Wheatu, thereupon, embarked in a plaited coconut leaf and arrived at the area which the planted coconut palm showed to be Rakahanga. Here he enacted the story of battering a canoe channel through the reef by hammering on one flat piece of coral with another. The part of Wheatu was taken by the village humorist. Thus, when Huku again arrived on the scene, a good deal of amusing byplay went on. To Huku's angry question why he was there, Wheatu—in soft, cooing tones, purposely exaggerated—replied that he was making a channel for him, and with much assumption of energy Wheatu battered away on the piece of coral. When Huku ordered him to leave, Wheatu pursed out his lips and kept mumbling in imitation of Huku. When Huku turned away, Wheatu stuck out his tongue at him, to the enjoyment of the audience. Finally Wheatu had to embark on his coconut canoe. When he was safely embarked, he added a modern Western note to his acting by placing his thumb to his nose and spreading out his fingers. By this time, orchestra, chorus, actors, and audience were satisfied. Huku again protruded his lower extremities through his coconut leaf and paddled his stormy way home in the wake of Wheatu, who had been doing fancy steps to the rhythm of the gongs. With a crash of the goatskin drum, the play was over.

In one play concerning the voyage of Tuahu and Waikohu to Hawaiki, the upper end of a coconut tree was carried in by about 20 men and planted

upright in the village street. It had a nut tied to one of the branches. The tree was guarded by an old blind woman. Waikohu landed on Hawaiki and climbed the tree without seeing the old woman. He dropped the nut to the ground and aroused the blind woman, who, stationing herself at the foot of the tree, captured Waikohu as he descended. A fire of dry coconut leaves upon which to cook Waikohu was lit, but by means of an incantation Waikohu caused the smoke to fall upon the sons of his captor and so escaped.

Another Rakahangan play depicted the departure of the people to Manihiki. A woman of high rank remained behind purposely, and she had some trouble with the spirits who haunted her lonely stay. The spirits were represented by about 20 children, who were naked except for loin cloths and, liberally plastered with grey mud, looked their ghostly parts. In one scene they danced very effectively.

In Manihiki, our departure by schooner for Tongareva was delayed until the local people put on a *nuku* representing the voyage of an ancestor to Aitutaki to see a hala tree that had been planted there by the ancestor's grandfather. The hala tree was duly represented.

Their reproductions of historical events in the form of *nuku* are greatly enjoyed by the people. Though technique may have altered slightly, the *nuku* are old and are enacted throughout the Cook Islands, as well as in Society Islands and the Tuamotus. The *nuku* reflect the deep-seated interest taken in traditional history, and no doubt have assisted in the memorizing of some of the events of the past.

Musical Instruments

A wooden gong (*koriro*) is made by hollowing out a section of tree trunk or branch (pl. 11). The opening is narrow and the hollow interior widened out. The ends are closed. The gong is similar to the *pate* of Cook Islands. The word *pate* is used locally as a verb meaning "to strike a gong," as in "ka pate te koriro" (the *koriro* gong is being struck). The gong is beaten with a single stick to give time to dances, and it is also used when announcements are cried through the village.

A double gong in Bernice P. Bishop Museum (pl. 11, *A*) is formed of one piece of wood twice the depth of an ordinary small gong, so that slot openings and cavities can be formed on opposite surfaces. The outer surface of each half is convex from above down, and a longitudinal horizontal groove is formed by the meeting of the two curves. This gives the appearance of two gongs stuck together by their under surfaces. Outside the ends of the slot openings, pearl-shell discs are inlaid for ornamentation, and nicks are also cut on the side edges opposite. Though both slots and cavities are of approximately the same dimensions, there is a slightly different tone when

the slot rims are struck. Such differences of tone could be utilized in playing, but the double gong was not mentioned to me by my informants. It is unusual and may have been a freak experiment.

Shell trumpets (*pu*) were formed from *Cynatium tritonis* shell, as in other parts of Polynesia, by making a hole through about the third whorl from the apex. No wooden reeds or mouthpieces were used.

A rattle made of split coconut leaf midrib was used in dances to supplement the wooden gongs, and the hands were also clapped to give time.

Sharkskin drums and flutes were unknown. Nowadays, large drums of European pattern are made with goatskin membranes. These drums are beaten during dances and historical plays, and with the wooden gongs form the orchestra.

RELIGION

THE GODS

The Rarotongan missionary, Aporo, is responsible for the following statement (13, p. 150):

> There are no gods of their own in these two islands; their gods were stolen from Utone by Ngaro-purui and Ngaro-vaaroto; Patu-kare was the guardian of the gods, whose names were Te Puarenga and Te Uru-renga, whilst another god named Ikaera drifted ashore onto the island. Te Puarenga is at Tau-unu at the *marae* named Te Pouhiteru; Ikaara (sic) is at Tukao at the *marae* named Marae-okoroa; Te Uru-renga is at Rakahanga and Variu is the name of his *marae*.

Aporo landed in Manihiki in 1849 and thus had the opportunity of getting information before the culture underwent material change. The statement that the people had no gods of their own evidently means that there were no gods brought by the first settlers. Tupou-rahi made a statement that Huku, the brother-in-law of Toa, had a god named Mokoroa-i-taupo located at Maungatea in Rarotonga. It is natural that the god remained with him in Rarotonga and was not given to his sister, Tapairu. Toa was a warrior and brought no priest with him. The statement that the people had no gods thus fits in with traditional history. Toa's lack of scholarship receives further corroboration from the lack of any myths concerning Tane, Rongo, Tangaroa, and the brotherhood of major gods so widely spread through neighboring regions. Tangaroa is actually mentioned as the grandfather of the Maui brethren and the possessor of fire.

Aporo states that the first two gods were stolen by Ngaro-purui and Ngaro-vaaroto. In the first of these names we may recognize Ngaro-puruhi. He is evidently the youngest brother of Whati-akau, as given by the genealogy of Tupou-rahi (Table 13). As his elder brother, Tangihoro, is credited with making voyages to foreign parts, the younger brother is likely to have gone with him. The genealogy places Ngaro-puruhi in the 7th generation chronologically. Thus, owing to lack of teachers and priests, the people had no gods from the time of the settlement of Rakahanga until the 7th generation, a period of over 150 years. It is not evident from Aporo's statement whether the Utone mentioned was a man or a place, but clearly the two gods, Te Puarenga and Te Uru-renga, were introduced from another island in the 7th generation of occupation. Tupou-rahi stated that the care of the family gods (*whare urunga*) was entrusted to Ura, an elder brother of Ngaro-puruhi. This statement would have no force but for the additional information recorded by Aporo that gods were actually introduced by his brother, Ngaro-puruhi. The Patu-kare mentioned by Aporo as the guardian of the gods was probably Ura under another name.

Te Puarenga, one of the stolen gods, was established at the marae in the

village of Tauhunu on Manihiki; the site is near the present church. The Aporo narrative gives the marae the name, Te Pouhiteru, but this is probably a misprint, as I was told that its name was Poutuuteru. Te Puarenga was the god of the *Whainga-aitu ariki* and was thus the principal god of the Heahiro and Mokupuwai tribes. This again fits in with genealogical evidence, because Ngaro-puruhi, the procurer of the god, was the youngest brother of Whati-akau, whose name was adopted by a subtribe of the Heahiro tribe.

The question of the establishment of the Poutuuteru marae is also raised. When Ngaro-puruhi stole the gods, he must also have brought away with him some of the observances associated with the gods. One observance was probably the building of the marae on which the necessary ritual could be conducted. It is likely, therefore, that the Poutuuteru marae was built in the 7th generation, when the knowledge of maraes was revived or introduced through the voyage to other lands. This again throws light on history, for it indicates that settlement on Manihiki had occurred by the 7th generation.

The guardianship of the god must have descended in the family of Ura or Patu-kare, but later, after the establishment of the dual *ariki*ship, it passed to the *Whainga-aitu* of the tribe with which the god was associated. Another difficulty is created by our lack of knowledge of the details concerning the manner and time at which the change in guardianship took place, for the first *Whainga-aitu,* Temu-matua, was placed by his uncle Rikiriki under the protection of the god Hikahara, who belonged to the *Whakaheo ariki.* We can only assume that though retrospective history shows a clear-cut division between the *ariki,* gods, and tribes, this exactness was not actually defined in the 11th generation, but was inaugurated then and assumed clarity later.

Te Puarenga was offered up as a burnt sacrifice by the missionary Aporo after Christianity was accepted by the people. Te Raina, son of Aporo, related that his father examined the heathen idol before destroying it. He said that it was made of breadfruit wood (*kuru*), which again corroborates the foreign origin of the god, for the breadfruit has only been introduced into both atolls within the last few years. The wood was ornamented with sennit braid lashed in a pattern (*whakatiki ki te kaha*), inlaid with white shell (*tiha*), wrapped up in a mat (*moenga*), and further bound with sennit. It was kept in a special house on the marae. Its destruction constitutes an irreparable loss, for had it been preserved as a missionary trophy of the chase, its island of origin might have been revealed.

Te Uru-renga, the other stolen god, was kept at the Variu marae on Rakahanga, according to Aporo. Neither the god nor the marae was mentioned to me. However, as the god also was acquired by Ngaro-puruhi, it was probably also a *Whainga-aitu* god.

Hika-hara, referred to by Aporo as Ikaera and Ikaara, was a locally manufactured god. Aporo stated that another god named Ikaera drifted ashore onto the island. What drifted ashore was a log from foreign lands (*no hahake*). It was cast up on the island of Motu-whakamaru in the southern part of Manihiki. The log was of reddish appearance in the water (*muramura i roto i te wai*). All drift material is of interest to a people isolated from foreign contact. The *Whakaheo ariki* went to Motu-whakamaru, viewed the log, and had it brought to Tukou, where he and his tribes lived. The log was laid outside the house of the *ariki,* and in the ordinary course of events various objects were laid upon it and against it. In the morning the objects were found scattered. The power of repelling objects was attributed to the log and revealed that it had power (*mana*). In the night the log was observed to show a phosphorescent light (*purapura*). It was deified by the *Whakaheo* as his god (*kua whakariro hei atua nona*). No information was obtainable as to whether the log was shaped and ornamented with sennit to follow the pattern of the stolen ready-made gods. If Aporo subsequently added it as fuel to the fire of his missionary zeal, he gave no detail of its construction.

Two prohibitions were enacted in connection with Hika-hara. First, no fire was to be lighted at night, and the people ate the evening meal in darkness. Second, if the hand was burned while cooking fish, on no account was it to be put in the mouth. Infringements of the two prohibitions were considered sins against the god, who punished the offender in one of two ways. The person who lit a fire felt a pain in his foot as if it had been stamped upon. Thus it was said that the god stamped upon the offender's foot (*ka takahi te waewae*), the foot swelled up, and death followed. If the hand was put into the mouth, the tongue swelled up and the person died. Thus the two punishments were swelling of the foot or swelling of the tongue, both followed by death.

As the *Whakaheo* was under the protection of the god, any sin against the *Whakaheo* was automatically punished by the god. The sin against the *Whakaheo* was to steal his food. For such an offence, Hika-hara metaphorically stamped upon the offender, who had nothing left to do but to die of a swollen foot.

If the *Whakaheo* became angry he called up his god (*kua whai i tana atua*), who sent wind, rain, thunder, and lightning, evidently to demonstrate that the *Whakaheo* had the *tira* or power over things celestial, and thus to warn his people not to proceed too far in a direction which angered him.

The statement that the *Whakaheo* himself went to view the log stranded on Motu-whakamaru indicates that Hika-hara could not have been created until the dual *arikiship* was in existence. Which one of the line of *Whaka-*

heo went to Motu-whakamaru was not mentioned, but as Temu-matua, the first *Whainga-aitu,* was cured of his weak constitution by Hika-hara, the period is located as the 11th generation. The creation of the god was contemporaneous with the creation of his high priest, the priestly *Whakaheo.*

Hika-hara was located at a marae on Tukou, the Manihiki home of the *Whakaheo* tribes. Aporo says the name of the marae was Marae-okoroa, but my informants stated that it was called Te Koutu.

The above gods seem to have been the major gods, whose officiating priests were the *Whainga-aitu* and *Whakaheo.* They were in authority over the larger groups of two tribes. In addition, there were a number of minor gods that were the property of such smaller groups as subtribes.

MARAES

It seems necessary to provide a church, temple, or dedicated space of ground where the people may watch the priests perform the ritual to the gods. The gods, the priests, and the people thus come together in their respective relationships to each other. The public religious gathering places were termed maraes in Manihiki and Rakahanga as in the neighboring areas. The maraes were constructed on the islands inhabited by the people, and as the occupied islands were small, the maraes were on the outskirts or actually in the villages of Te Kainga, Tauhunu, and Tukou. The result of this close proximity to villages which continued to be occupied throughout the Christian period was that all the maraes have been utterly demolished. They shared the destruction of the gods. No maraes were built on the other islands, and thus they had no chance of escape as did many of the maraes of Tongareva. The names, however, are remembered, and the sites can still be pointed out by the older men. The names of five maraes are associated with Te Kainga, but accounts from different sources are conflicting. In Manihiki there was one marae at each village.

1. Punariku was said to be the first established marae. It was in existence before the dual *ariki*ship was established but was not built until the people began to increase. When the people split into four tribes, another marae called Huku-wananga was made. According to Pukerua, the Punariku marae was then used by the older tribes of Numatua and Tiangarotonga. The first marae built on Tongareva by the ancestor Mahuta was named Punaruku. The site of this marae was not pointed out to me on Te Kainga.

2. Avarua is on the seaward side of Te Kainga and was said to have been Matangaro's marae. The statement may apply to the Mata-ngaro group as a whole and not to Mata-ngaro, the son of Toa, as the marae was introduced with the stolen gods at a later date. That it belonged to the Mata-ngaro group is substantiated by its situation on their side of the village. The marae later served the *Whainga-aitu* tribes, Heahiro and Mokopuwai. It was said to have been paved formerly with coral slabs, but no evidence remains.

3. Huku-wananga on the lagoon side of Te Kainga, from its position, must have served the Hukutahu group and thus the *Whakaheo* tribes, Nu-matua and Tiangaro-

tonga. Pukerua's statement (p. 208) is thus not supported by the site of the marae. No traces of pavement remain.

4. Mua was situated in about the middle of the village of Te Kainga and is still distinguished by a large rounded earthen mound, resembling the turtle ovens of Tongareva. Coral slabs were found lying here and there and were said to have formed part of the pavement of the marae. Mua was a public marae which, from its position, served all four tribes when they united for a common function. Avarua and Huku-wananga were the tribal maraes and Mua, the common national marae.

5. Variu (Whariu?) is the Rakahangan marae stated by Aporo to have been associated with the god Te Uru-renga, and it may possibly have been another name for the Avarua marae.

6. Poututeru, the *Whainga-aitu* marae at Tauhunu, occupied the site of the present church which supplanted it, and here the god Te Puarenga was established.

7. Te Koutu was the *Whakaheo* marae at Tukou where Hikatara was established. Aporo gives Hikatara's marae as Marae-okoroa, which may be an alternate name.

Each of the two tribal groups had its own marae in the separate villages on Manihiki, and in their separate divisions in the one village on Rakahanga. In Rakahanga they had, in addition, a common marae, as they lived close together. Undoubtedly, owing to their separation on Manihiki, no common marae was set up there.

Merely from verbal description, it appears that a space was set out and paved to define the marae. There may have been some coral pillars set around the boundaries, but the lack of cut slabs of coral on the neighboring graves indicates that the maraes were not so well made as in Tongareva (29, pp. 148-159). No evidence is forthcoming as to whether raised stone platforms were built to form altars as in Tongareva, but the god-house on the marae was present, according to Aporo.

THE PRIESTHOOD

No priests accompanied the first settlers, and consequently no specialized line of priests came down by descent. Functions of a priestly nature were discharged by the head of the group and probably were concentrated in the single line of *ariki* chiefs. In the 7th generation the introduction of gods necessitated the creation of a keeper of the gods. This office went to Ura or Patu-kare and probably descended in their line until the 11th generation, when the position passed to the dual *ariki*. The *whakamaru* also acted as the media of the minor gods. The acquisition of temporal power by the heads of the tribes certainly took away some of the temporal power from the dual *ariki* and forced them into the position of a senior priesthood. The establishment of the dual *ariki*ship split the priestly powers exercised by the *ariki* so that one *ariki* exercised supernormal power in the air and the other on land and sea. This division of priestly power was symbolized by the words *tira* and *papa*.

The special function of the *Whakaheo* was to bring about good weather during the voyages between the two atolls and to control the wind and

weather not only for voyaging but for fishing. The *Whainga-aitu* exercised his powers to induce productivity of the land and sea. If in good humor, it was said that he could invoke the sea so that fish came ashore (*ka tarotaro i te moana kia haere mai te ika ki uta*). On the other hand, if he were angered, he invoked his god so that the sea became rough and no fish or turtle could be procured. Both the *Whakaheo* and *Whainga-aitu* suffered from the lack of the hereditary background of scholarship that is the birthright of the established Polynesian priesthood.

RITUAL

Details of ritual are lacking. The ritual must have been influenced not only by the break of transmission in priestly ritual but also by the general poverty of the cultural and material environment. There was a lack of textiles with which to manufacture vestments and the poor range of foods restricted the choice and lavishing of offerings.

The general ritual (*whai*) took place on the marae. Individual incantations were termed *tarotaro*. When the *Whakaheo* or *Whainga-aitu* went to the marae, he was accompanied by the *whakamaru* of his tribe and subtribe, who acted as assistants. Food and fish were taken to the marae and after the ritual in which it was offered to the god, the food was divided among the people.

The following brief incantation was recited by the *Whainga-aitu* on such occasions, and the *whakamaru* joined in the refrain, "ua!":

Taimaha i te popongi,	Food in the morning,
Koi mua ana ia.	First is He.
Ua!	Ua!
Taimaha i te awatea,	Food in the daytime,
Koi mua ana ia.	First is He.
Ua!	Ua!
Taimaha i te ahiahi,	Food in the evening,
Koi mua ana ia.	First is He.
Ua!	Ua!

"First is He" refers to the god. The god having thus been exalted, the material food could be distributed to the people. The ceremony was equivalent to a petition for blessing on the food.

Mention has been made of the part taken by the *whakamaru* (p. 55) and the *whakatapaeru* (p. 56) when the voyages between the atolls were made.

MINOR GODS

It was generally held that the *tukuwhare* (subtribes) had gods of their own in addition to those controlled by the priestly *ariki*. Much confusion, however, has been caused by the attitude of different families to certain foods

which are prohibited. Thus the members of one family group or subtribe will not eat crayfish because, if they do, they break out in a rash or hard lumps, the abdomen swells up, and they become exceedingly ill. Another family group will not eat the *koveu* or *tupa* land crabs. Some prohibited the use of certain fish, such as the *taeha, hue, hakura* (sawfish), *mango* (shark), and *patuki-whara-kawa,* and also the *honu* (turtle). Others will not touch certain birds, as, for example, the *kotaha* (frigate bird) and *tawake* (*Phaeton rubricauda*). These foods are *arai* (to prohibit). The eating of the *arai* is supposed to bring on illness, generally urticarial skin rashes and digestive troubles. In native psychology there is no distinction in principle between such manifestations of illness and those of swelling of the feet or tongue caused by breaking the prohibitions associated with the major god, Hikahara. The symptoms of illness are not associated in the mind with such natural causes as indiscretions of diet but with some supernormal agency which is offended. Punishment follows, as revealed by a form of illness which may result in death. The term *atua,* usually applied to definite established gods, is also applied to anything malign or disagreeable. Thus, when a Rakahangan refers to the *koura* (crayfish) as his *arai,* we know that it is prohibited in his family, as it will cause urticaria and digestive troubles if eaten. When, however, he states that the *koura* is his *atua,* we are not sure whether he regards it merely as being disagreeable and malign as far as he is concerned or whether he actually regards it as a family god. Both views seem to be held.

Tupou-rahi stated that the family *atua* (gods) were fish, birds, or crabs. His own was the *hue* fish. Such gods had material forms in wood or stone, which might be shaped to represent them. These were wrapped in matting, tied up, and perhaps kept in a basket. They were kept in a fenced-off place near the dwelling house of the guardian, the *whakamaru.* Tupou-rahi seemed to imply that the term *whakamaru* applied to the heads of family groups who had charge of the family gods. The title would thus apply to the heads of subtribes, but some informants restricted it to the heads of tribes. When the people moved from one atoll to the other, the *whakamaru* had charge of the basket containing the god. On arrival at the other atoll, the gods were deposited in small inclosures, not maraes, which were tapu, so that no one went near them except the *whakamaru.* Another informant, Araipu, said that such minor gods as the *kotaha* (frigate bird) were *tuku-whare* (subtribe) gods. They had material representations which were kept on the loft (*pahata*) of special houses. It was on the loft of these special houses that the body of a chief was placed after death.

The *whakamaru* (guardians) consulted the gods before any family enterprise, such as fishing or sea voyages. He recited the appropriate incanta-

tion (*tarotaro*) in order that success (*manuia*) might crown the undertaking. If success did not follow, it was held that the ritual had not been correctly conducted (*kua he te tarotaro*) or that something else was wrong.

This mechanism indicates clearly that there were family gods, definitely treated as such. The weak part in the system is that the gods had no definite personal names but were alluded to by the general name of their species. Some informants maintained that the prohibited foods were not treated or worshiped as gods but merely regarded as *arai.*

The prohibited foods, if regarded as gods by the affected families, were not so regarded by the others. Family groups could eat all prohibited foods except their own *arai* and in doing so gave no offence. A patient, Metutera, whom I treated on Rakahanga, had the crayfish as his family *arai.* A party of us was going out in the evening torching for crayfish. Metutera informed me that were it not for his illness he would accompany me to give me good luck. Crayfish, he said, were attracted to him and though he would not kill them himself he was quite willing to attract them toward me in order that I might spear them. Some of the older men supported Metutera's statement about the attraction he influenced over crayfish, saying that they had seen it demonstrated. Metutera could not eat crayfish without developing an urticarial rash and gastric disturbance. He was a member of the church and had no religious attitude toward the family *arai.* He maintained the family prohibition because he had suffered from breaking it in the past. His present illness he attributed to inadvertence. Another family had cooked a crayfish in an earth oven with other food. He was offered some of the other food, and not knowing that a crayfish had been cooked in the same oven, he partook of it. Afterwards he broke out in a rash and hard lumps formed under the skin on his back. When I saw him, the skin had sloughed off and formed an ulcer about 5 inches across. He probably had had a carbuncle, but the coincidence of eating the tainted food with the development of the urticaria had convinced him as to cause and effect. However, the ulcer cleared up and he was on the way to recovery when I left. His attitude toward crayfish in general was not that of a person with superstitious fear of a family god but that of a normal person who realizes that he cannot eat a particular food without suffering for it. On the other hand, he derived satisfaction from the idea that there was some mystical bond between crayfish and himself which attracted them to him.

A traditional origin is given to some of the prohibitions. The crayfish prohibition is attributed to an incident in the voyage of Tuahu and Waikohu to some distant island said to be Hawaiki. Off Hawaiki, Tuahu dropped anchor outside the reef, and Waikohu swam ashore to explore. Waikohu saw a coconut tree, climbed it, and dropped a nut to the ground. An old

blind woman, guardian of the tree, heard the thud of the nut striking the ground and came to the foot of the tree just as Waikohu was descending. Feeling about the trunk for the thief, her hands encountered the descending legs, which she immediately seized. She raised an alarm; her stalwart sons appeared. Waikohu was taken prisoner and his arms were bound. Meanwhile Tuahu, tired of waiting, proceeded to pull up the anchor. This he was unable to do, as the crayfish had massed at the bottom of the sea and jammed the stone anchor in a cleft of the rock so that he could not raise it. Thereupon, Tuahu decided to wait longer. The blind woman's sons, under her direction, lighted a fire to cook Waikohu. Waikohu succeeded in loosening his arms, and as he was thrown onto the fire he called, "Whakahinga!" (to cause to fall). The magic word caused a smoke screen to arise and fall between him and his captors. Under cover of the smoke screen, Waikohu escaped to the reef, plunged off, and swam out to the canoe. The crayfish, evidently realizing that Waikohu had returned, freed the anchor so that when Tuahu again hauled on the rope, the anchor came up readily. The timely action of the crayfish, by delaying the canoe, thus saved Waikohu's life. In gratitude, Waikohu prohibited himself and his family ever to eat crayfish. Thus the crayfish became an *arai* in the family descended from Waikohu. Unfortunately, I did not get Waikohu placed in a pedigree and cannot locate the alleged origin in its chronological position.

Another tradition concerns the *tavake* (tropic bird). Ngaro-tara-maunga, in an adventurous spirit, decided to sail across some whirlpool known as the *rua tai koko*. It was far distant, so he told his family that he would send a messenger back. Some time after Ngaro-tara-maunga had gone, a tropic bird alighted near the house of the family. The bird made no attempt to fly away when approached. It was caught and put in the oven for cooking. When the oven was opened the bird was uncooked, so the oven was covered over again. A second time the bird was uncooked, but at the third uncovering of the oven the bird was not only uncooked but so much alive that it flew away. It was then realized that the bird was the expected messenger from Ngaro-tara-maunga who had lost his life in the whirling waters of the *rua tai koko*. Perhaps from the failure to cook it, the *tavake* was prohibited as a food to the descendants of Ngaro-tara-maunga.

A short song commemorates the unsuccessful culinary operations:

Taku manu kua umu tahitia, Rua raki e he rire, Rua raki e he rire to, Taku manu he ri to.	My bird has been cooked once, (Refrain, repeated.)
Taku manu kua umuruatia He rua rakie he ri tò.	My bird has been cooked twice, (Refrain.)

Taku manu kua umu teru tia,	My bird has been cooked thrice,
Taku manu kua rere, kua ngaro,	My bird has flown, is lost.
He rua raki e he ri to.	(Refrain.)
Taku manu kua rere.	My bird has flown.

The words, though simple, are pleasing in the native language and they record a historical incident, though the song has a mythical ending.

PROHIBITED FOODS

Most of the prohibited foods were associated with families, and I could get my informants to connect none of them except the turtle and the frigate bird with definite subtribes. The turtle (*honu*) was said to have been the *arai* of the Taupo subtribe of the Numatua tribe. The frigate bird (*kotaha*) was said to have been the *arai* of the whole Numatua tribe, but later, as the people increased, it became restricted to the Pu-tauhunu subtribe.

The presence of zoological gods with their prohibition as food naturally suggests totemism. However, in no instance is the prohibited food in its personified form regarded as having anything to do with the origin of the family which avoided it as food. All the families and subtribes had their normal origin from human ancestors, and the creation of material gods and the use of ritual in connection with them seems to be a late development. It is tempting to assume, from the nature of the symptoms associated with breaking the prohibitions, that the system had its origin in unpleasant experiences and reactions toward particular foods. Many people of other races cannot eat crayfish, lobster, crabs, or shellfish without digestive disturbances and the production of an urticarial rash. Some Rakahangan ancestor suffered in this way on eating crayfish and it became his *atua* in the sense of being disagreeable materially and malign through failure to appreciate natural causes of disease. The ancestor, therefore, tapued the food and ceased to collect it in his fishing operations within the lagoon. As it disappeared from his family menu, it also became tapu to his children. One can imagine the children asking the father why they did not have crayfish, like other families, and the father describing in detail all the symptoms that occurred on eating crayfish. He had to excuse what might have been regarded as a lack of skill by impressing upon his family the real cause for the absence of crayfish from the family diet. In this manner, he passed the prohibition on to his children. In Polynesian psychology there is a dual reaction that is extremely common and of great significance for an understanding of the attitude toward institutions. The very fact that a person suffers through eating crayfish indicates clearly that there is some supernormal influence that takes particular notice of him and selects him, so to speak, from his fellow men. His self-esteem is flattered. It is the common people of no account of whom the unseen powers take no notice. The inconvenience of a personal tapu is

balanced by the satisfaction the individual experiences from being important enough to have a tapu. The satisfaction of the individual is shared by the family. The tapu becomes a family tapu, and in time a subtribal tapu. The crayfish that caused inconvenience to a single ancestor thus in the course of time becomes a subtribal *arai*. It may be that the idiosyncrasy toward the particular food reappears from time to time as manifested in the authentic case of Metutera, but with the mass of the subtribe the factor that keeps the prohibition from being broken is not so much fear of consequences as the pride in having a peculiar tapu. I know personally that men would be extremely disappointed if unpleasant symptoms did not arise after eating the *arai*. They desire so much that the power of the *arai* should continue that on some occasions symptoms are exaggerated and may even be falsified. The lack of reaction to the breaking of a tapu diminishes the status and self-esteem of the individual, and he would rather conceal the fact that the god had taken no notice of him than to blazon forth his own inferiority.

It is well known that around certain atoll islands certain fish are poisonous at certain seasons. An urticarial rash and gastric trouble are among the common symptoms of fish poisoning. Thus, besides an individual idiosyncrasy in regard to crayfish and crabs, disasters from the eating of poisonous fish provided the origin for fish tapus. These again were associated with certain families and spread to subtribes. Some of the present older inhabitants assured me that they had eaten their *arai* without ill effect, but this they attributed to the breaking down of the power of the old institutions through Christianity. On the other hand, I have been somewhat suspicious of the veracity of some who informed me that they could not eat their *arai* without suffering the classical symptoms. Little doubt can be entertained that in the original cultural background the person who broke a prohibition would suffer psychologically, but apart from an idiosyncrasy or a poisonous fish, the question of how far such psychological guilt would result in physical symptoms is a matter for conjecture.

That similar prohibited foods exist in Tongareva shows a similar physical reaction to similar causes. However, in the far-away high islands of Hawaii similar food prohibitions exist among families, and their supernatural association is believed in.

RELIGIOUS OBJECTS

The missionary Aporo (13, pp. 150-151) states:

> Another species of gods were stones; they would place them in their girdles when going out to sea or war, or when they slept. Another custom they had of making a god of a dead man. They used to take the head, teeth, nails, bones, and hair, after death. The bones of the *ariki* were given to the warriors, and his family. . . . Another god they had was Matariki (the Pleiades) which they worshipped, and another was the *pukatea* leaf, the *paiku* and the *nikau* (palm), and the oil of the coconut.

SICKNESS AND DEATH

MEDICINE

With most, if not all, branches of the Polynesian race, the theory of medicine is associated with religious concepts. Certain symptoms which denote a departure from normal health were regarded as manifestations of the displeasure of the gods. They were punishments inflicted for infringing prohibitions that had been established in connection with religious observances. Thus, a swollen foot or a swollen tongue was a punishment by the god Hikahara. Urticarial skin rashes and digestive troubles were associated with the family food prohibitions, which had come to have a supernormal significance. It is not clear whether or not a treatment through ritual to placate the supernormal cause had been in use. It is difficult to obtain exact details from a people who have come to regard "heathen" practices with shame.

The power of causing illness and death to others by the use of occult powers, or black magic, was not referred to in any conversations, except in the story of one *Whakaheo ariki.* He went to Honolulu after European transport was available and is said to have caused the death of a chief there by putting a hair from his head in the chief's bowl of kava. But for this isolated example, the *Whakaheo* and *Whainga-aitu* chiefs seem to have restrained their displeasure with their people to calling up rain, thunder, and lightning through their influence with their gods.

A people with a psychological attitude toward the manifestations of ill health usually seeks a psychological remedy by consulting priests and going through the established observances and ritual. There is no incentive to explore the field of herbal remedies, and the native pharmacopoeia is thus a very limited one, even supposing that medicinal plants grew on the islands inhabited.

The one plant used for minor ailments was the coconut. The diet of children was formed from the special use of various stages of the coconut, as described on page 101. The *hinu romonga* oil was used in massaging babies. The general term for massaging was *kotikoti*; pressing movements with the fingers were termed *tauromi* and stroking movements, *maoro.* The oil was also used to make the hair grow. The *hinu takataka* oil from the *takataka* nut was used as an application for boils (*tahora*) and any such obvious tumors as sebaceous cysts. It was also used as a dressing for burns, ulcers, and cuts. The sediment from the *hinu pipiro* oil was applied to ringworm (*hune*) after the part had been washed in salt water. The *uto puni* stage of the coconut was used for cuts and wounds to stop the bleeding. A slice of the *uto* was placed over the cut and changed two or three times until the bleeding ceased. A fresh piece was applied and kept on for one or two days. Coconut cream was used as a purgative.

The atolls are remarkably free of endemic diseases. The medical officers of late years report but little yaws. I saw one case of elephantiasis of the feet, but the patient had been to other islands and may have become infected there.

Leprosy has been known from time to time, but the origin is attributed by the natives to Hawaii. Dr. Andrews, Surgeon on H.M.S. *Ringdove,* made a medical report on the islands in a New Zealand Parliamentary Paper printed in 1893. He stated that the first case was developed by a man named Tukerau, who, at the age of 18 years, left for Honolulu in an English trading barque (25 years before 1893). Tukerau developed leprosy on his return. The second leper was a man, Akatu, who visited Honolulu in 1874 and lived with a leper family. On his return in 1876, he developed the disease. The origin of the disease in the neighboring atoll, Tongareva, is also attributed to Hawaii.

DEATH

When a chief died the *whakamaru* (tribal head) placed the corpse on the platform (*pahata*) of the house in which the *tukuwhare* gods were kept. Some corpses were not buried (*kare e tanu*). Relatives mourned in the house on the floor below and bore the odor of putrefaction out of affection (*aroha*) for the deceased. They even allowed the fluids of decomposition (*wai o te tupapaku*) to fall down upon them. The body was allowed to remain in the loft of the house until it had dried up. Many human bones are to be seen on the atoll, and are evidence that all bodies were not interred in the ground.

The missionary, Aporo, is responsible for the following description (13, p. 150):

> After any man had died, from the second until the fifth night they took food for the deceased and hoped then to upraise him to life. This is one of the "upraisings":
>
> | | |
> |---|---|
> | E ara! e tu ki runga. | Arise! stand upright. |
> | Tera mai to mango | Here is thy shark |
> | E te ika, kia kai koe. | And fish, that thou mayest eat. |
>
> They all cried and cut themselves, and knocked their heads, when they found the deceased did not arise; and thus they did for many days.

Burial places were termed *turuma.* The dead were interred in pits and the sites marked with small coral slabs set on edge, after the style of the smaller graves on Tongareva. The coral slabs were set to form a rectangular inclosure, above the grave, about 7 feet long by 2.5 feet wide. The projection above the surface was from 10 to 12 inches. None of the large worked historic slabs forming headstones, so common on Tongareva, were seen. Though a number of graves were seen on the island of Te Kainga, it was stated that it had been customary to bury the dead on the other islands where the families had their property rights.

THE CALENDAR

NIGHTS OF THE MOON

The lunar month (*marama*) was divided into nights of the moon. Commencing with the new moon, each night received its own distinctive name, which came to denote the size or stage of the moon on a particular night. A night name could not be transferred to a night when the moon was not in the stage denoted by the name. The Rakahangan list of nights of the moon contains 30 names and is divided into two divisions. In the first division (*Ohiro*), consisting of 17 nights, are the nights when the moon is rising to its zenith (*te au po e rewa ai te marama*). In the second, consisting of 13 nights, are the nights when the moon is getting darker (*te au po o te kau pouri*).

The notes on the nights of the moon gathered in Rakahanga were obtained from the writings of an old man named Haumata-tua, who recorded them in a ledger now in the possession of Aporo of Rakahanga. The names as spelled in this manuscript are given in table 16. The actual night names without the introductory particle *ko* or the definite articles *te, ti,* or *ta,* with the pronounced *h* and *wh* inserted, are given in parentheses.

Table 16. Rakahangan Nights of the Moon, First List

Te au po o te Ohiro (The Nights of the Ohiro)

1. Te atu (Atu)
2. Te tutai (Tutahi)
3. Te turoto (Turoto)
4. Tamatea tutai (Tamatea tutahi)
5. Tamatea turoto
6. Tamatea akaoti (Tamatea whakaoti)
7. Ko Tiooata (Hoata)
8. Ko Tiari (Ari)
9. Kote korekore tai (Korekore tahi)
10. Ko Uune (Hune)
11. Ko Tioau (Ohau)
12. Ko Tamaaru (Maharu)
13. Ko Tiotua mua (Otua mua)
14. Ko Tiotua muri (Otua muri)
15. Ko Tiotu (Hotu)
16. Ko marangi (Marangi)
17. Te etau maro (Whetau-maro)

Te au po o te Kaupouri (The Nights of the Darkening Period)

18. Rakau tai (Rakau tahi)
19. Rakau roto
20. Rakau akaoti (Rakau whakaoti)
21. Korekore tutai (Korekore tutahi)
22. Korekore roto
23. Korekore akaoti (Korekore whakaoti)
24. Tangaroa tutai (Tangaroa tutahi)
25. Tangaroa roto
26. Tangaroa akaoti (Tangaroa whakaoti)
27. Ko Tirongonui (Rongonui)
28. Ko Tane (Tane)
29. Ko Te mauri (Mauri)
30. Ko Te mutunga (Mutunga)

The name *Atu* applied to the 1st night is peculiar to the list. The name *Tutahi* (first) given to the 2nd night is followed by *Turoto,* meaning "inner." The 4th, 5th, and 6th nights form a group of *Tamatea* which are distinguished by the qualifying terms *tutahi* (1st), *turoto* (inner), and *whakaoti* (to finish, last). The triple grouping with the same qualifying terms is used three times in the second half of the month with the *Rakau, Korekore,* and *Tangaroa* nights. It is evident, therefore, that *Tutahi* and *Turoto,* as applied to the 2nd and 3rd nights, are qualifying terms applied to a triple group of which the last of the series is missing, for it is not logical to use the middle term *turoto* unless it is followed by a *whakaoti.* The group name has been dropped.

A widespread commencement consists of *Tireo* (1st), *Hiro* (2nd), and *Hoata* (3rd). With dialectical letter changes, this commencement is found in Tahiti, Tongareva, and Cook Islands. It is present in New Zealand, but in most lists from that area *Tireo* and *Hiro* (*Whiro*) change positions. Hawaii, like New Zealand, commences with *Hiro* (*Hilo*) but drops *Tireo* altogether and places *Hoata* (*Hoaka*) as the 2nd night. A list collected by K. P. Emory from Fagatau in the eastern Tuamotus gives *Hiro* as the 1st night and *Hoata* as the 2nd. From the distribution in the marginal areas of New Zealand, Hawaii, and the eastern Tuamotus, it would appear that the *Hiro* commencement is older and that *Tireo* has changed places with it in the central eastern area. Localities that do not now have the *Hiro* commencement are the Marquesas, Mangareva, and Rakahanga. It is evident, however, that Rakahanga once had knowledge of it but that *Atu* or *Atua* has displaced *Hiro,* which, in the form of *Ohiro,* came to be used as a term for the first 17 nights, and that *Hoata* has been displaced to the 7th night.

A widespread group that appears early in the first half of the month is the *Hamiama* trio. Stimson (24, pp. 327-328) in a Tahitian list gives a group of three *Hamiama,* qualified by *tahi* (1st), *roto* (inner), and *fa'aoti* (last), which follows the *Tireo* triple commencement and immediately precedes a group of three *Tamatea.* Rarotonga (32, p. 356), after the *Tireo* commencement, has two *Amiama* immediately preceding two *Tamatea.* Tongareva (29, p. 216) has the *Tireo* commencement followed by three *Samia,* which immediately precede three *Tamatea.* The *Samia* of Tongareva corresponds to *Hamia* or *Hamiama* with the final syllable dropped. In the Fagatau list *Hiro* and *Hoata* are followed by three *Hamia,* which in turn precede three *Tamatea.* It may, therefore, be inferred that in Rakahanga the *Tamatea* group, by being displaced to the 4th, 5th, and 6th nights, has also pushed up a triple *Hamiama* group ahead of it. The *Hamiama* group dislocated *Hiro* (1st) out of list, and *Hoata* (2nd) fell back immediately below the last *Tamatea.* Somehow or other, *Atu* took up the place of *Hiro,* which

left only two nights (2nd, 3rd) for the *Hamiama* trio. This resulted in the dropping of the last member (*Hamiama whakaoti*). In the course of time the group name was forgotten or dropped, and *Hamiama tutatahi* and *Hamiama turoto* now appear as *Tutahi* and *Turoto* for the 2nd and 3rd nights.

The dislocation of an earlier commencement by the *Hamiama* group is shown in other areas. For the Marquesas, Handy (14, p. 348) gives a list of three *Maheama* which occupy the 2nd, 3rd, and 4th nights; the Marquesan 1st night is *Tu*. In Mangareva, according to Williams (32, p. 355), the 1st to the 4th nights form a group of four *Maema*. *Maheama* and *Maema* are dialectical forms of *Hamiama*.

Considerable confusion is apparent in the names of the first half of the month. The 7th night is the displaced *Hoata* of the *Hiro* commencement. The 8th night, *Ari*, has a wide distribution. The 9th night, *Korekore tutahi*, is a single representative of a *Korekore* group, which is present in the first half in both Tahiti and Rarotonga. The retention of the qualifying term *tutahi* (1st) shows that it was originally the first of a group. The 10th night, *Hune*, is the widespread *Huna* of other areas, which, in most, falls on the 10th. In the 11th night, *Ohau*, if what is evidently a prefixed "o" is removed and *hau* transposed, we have *Hua*, a widespread term which is usually about two nights later. The 12th, *Maharu*, is widespread and generally on the same night. Two *Otua* (*Atua*) follow on the 13th and 14th, but most other areas have only one *Atua*. The 15th, *Hotu*, coincides in name and date with other areas. The 16th, *Marangi*, has the same name and date in Tongareva, Tahiti, and Rarotonga, but *Whetau-maro*, 17th, is evidently a local name which has replaced *Turu*. It will be noted that the 16th and 17th are regarded as nights of the full moon and are added to the first half so that the second period of the *kau pouri*, consisting of 13 nights, covers the decrease in the size of the moon.

After the confusion of the first half, the stability of the second half is all the more marked. It coincides in every particular with the Rarotongan list and differs from Tongarevan and Tahitian lists only in transposing the positions of the *Rongonui* (27th) and *Tane* (28th) names.

Another list, copied by Stephen Savage from the book of Aporo-ariki of Manihiki, is given in Table 17.

Table 17. Rakahangan Nights of the Moon, Second List

1. Te Mutunga	16. Tihowhotu
2. Tiatua	17. Te marangi
3. Tuatahi	18. Whetau-maro
4. Tuatahi-rua	19. Rakau-tahi
5. Tuatahi-toru	20. Rakau-rua
6. Tamatea-tuatahi	21. Rakau-toru
7. Tamatea-turua	22. Korekore-tahi
8. Tamatea-tuturo	23. Korekore-rua
9. Tehari	24. Korekore-toru
10. Korekore	25. Tangaroa-tahi
11. Tehune	26. Tangaroa-rua
12. Tiohua	27. Tangaroa-toru
13. Temahari	28. Te Tane
14. Tihotuamua	29. Te Rongonui
15. Tihotuamuri	30. Te Mauri

After naming *Te marangi* (17th), the reciter of the list remarks, "Kua tae ki te kau poiri." (The dark period is reached.) After the *Mauri* (30th), an explanation is offered, "The mutuanga Tiatua ka vero no te Ohiro." (The end of the *Tiatua* commences the *Ohiro.*) The first part (evidently to the *Marangi*) is headed, "te tatauanga po o te Ohiro" (the counting of the nights of the *Ohiro*).

This list has evidently been badly mutilated in the course of time. A significant item is the transference of *Te mutunga* (the end) from the 30th night to the 1st with the subsequent dislocation of the otherwise consistent second half. Thus the first of the *Rakau* group, which, over a very wide distribution, occurs on the 18th, is displaced to the 19th and all following names are displaced a night later so that the *Mauri,* which should be on the 29th, ends the list on the 30th. The transference of *Te Mutunga* to the first night of the moon has doubtless been due to the confusion which arose between the months which had 29 nights and 30 nights respectively. Savage considers from the remarks added to the list that the nights were divided into two periods termed *Tiatua* and *Ohiro.* The Manihikian dialect uses *ti* as an alternative to the definite article *te,* so that *Tiatua* is really the *Atua.* The *Atua* period corresponds to the *Kau-poiri* period of the second half. The statement that the end of the *Atua* commences the *Ohiro* points to a memory of *Hiro* commencing the month as in the Maori and Hawaiian tables. Unfortunately, both *Mutunga* and *Tiatua* have been confused as names for the 1st and 2nd nights and *Hiro,* or *Ohiro,* has been transferred to a name for the first half. The term *Atua* here takes the place of *Atu* in the first list and is probably more nearly correct. The utter confusion is indicated by the use of *Tuatahi* (1st) for the 3rd night and the terms *Tuatahi-rua* and *Tuatahi-toru* (2nd-1st and 3rd-1st) for the 4th and 5th nights, which is absurd. It

is again evident that a group name has been forgotten. From the position preceding the *Tamatea* group, the group was again probably the *Hamiama* series.

Another variation in the second table is the use of the numbers *rua* (2) and *toru* (3) to designate the last 2 of a group of 3 instead of *roto* (inner) and *whakaoti* (last) as used in the first table. In the second table *Tane* (28th) and *Rongonui* (29th), if brought back to the 27th and 28th, occupy the order and dates which occur in New Zealand and Hawaii as well as Tahiti, which, with the mention of *Ohiro,* would indicate that the second table represents an older series than the first table. If so, it may also be assumed that *tahi, rua,* and *toru* as applied to triple groups are older than the use of the forms *tahi, roto,* and *whakaoti.*

Confusion is also evident in the 14th, 15th, and 16th nights, which, as *Ti-hotu-mua, Ti-hotu-muri,* and *Ti-ho-whotu,* are all forms of *Hotu,* which is found but once in lists from other areas.

In spite of the confusion in names and their sequence, the Rakahangan lists show a marked affinity with eastern Polynesian lists and they have not one name in common with Samoa and Tonga.

THE ANNUAL CYCLE

The Rakahangan cycle contained 13 named months (*marama*). These were grouped into three periods in one classification and into two in another. A list was also given of the weather conditions, appearance of stars, and their relationship to food. An attempt was also made to correlate the native cycle with the European calendar months which may be regarded as merely approximate. The recorder solved the disparity in numbers by dividing the European month of May into two and apportioning a part to the two months, *Pipiri* and *Whakaau.* Unfortunately the order of these two short months is transposed in one of the three lists recorded.

The three-period classification (Table 18) was divided as follows: *A,* "te tau o te mata tonga" (the period or count of the *Mata tonga*); *B,* "te pouri" (the darkness); and *C,* "te au po" (the nights). A further explanation runs, "Tera tatahi ingoa o te mata tonga, na riri o te tonga." (There is another name for the *mata tonga,* the wrath of the south wind.) The period of the *mata tonga* contained six months (*e ono marama*). Each of the six names is prefixed by the article *ko,* which simply indicates the proper name of the month. Before commencing the list with the first name, *Pipiri,* the following was written in the Aporo manuscript: "Te akaauanga o Matariki." Aporo explained the meaning of *akaauanga* (pronounced "whakaauanga") as, "The six stars of the Pleiades could be seen plainly." In other words, it referred to the reappearance of the Pleiades. The dark period has

three months (*a teru ona marama*). With the last two months of the dark period the definite article *te* is used. The nights period contains four months all prefixed by the article *te.*

Table 18. Rakahangan Annual Cycle, Three-period Classification

A. The Period of the Mata Tonga			
1. Ko Pipiri (?)	May (15 days)	Te matangi, te ua, whatitiri; te takaanga o Matariki ki raro	Wind, rain, thunder; the Pleiades are low in the sky
2. Ko Unuunu	June	Matangi rahi (puwai)	Strong wind
3. Ko Oro-a-manu	July	Maru te matangi, kua kopia e Paroro	Wind calms down, being inclosed by Paroro
4. Ko Paroro-mua	August	Te taenga o te ika tomore ki runga i te whenua	The *tomore* fish arrives
5. Ko Paroro-muri	September	Kua humaria te matangi, kare e whatitiri, kare e ua	The wind has ceased, no thunder, no rain
6. Ko Muriha	October	Kua humaria te rangi, kua humaria te tai	The heavens are calm, the sea is calm
B. The Dark Period (*pouri*)			
7. Takaonga	November	Whakaahu te whenua	The land is prepared (for food)
8. Te Hiringa kerekere	December	E marama kino	A bad month (winds)
9. Te Hiringa ma	January	Kua ta ma te whenua, Te kite anga mai o tetahi tangata, ko Whaniu, e hetu	The land is swept clean, the appearance of a person, Whaniu, a star
C. The Night Period (*au po*)			
10. Te Utu-a-mua	February	Kua kitea tetahi hetu, ko Tautoru, matangi tau tika, noho ki roto	A star, Tautoru, appears. The wind remains set between the *whakarua* and *tonga* points of the compass (*roto*)
11. Te Utu-a-muri	March	Te angaanga tei roto ia Te Apura, ka hakatere taua hetu i te matangi o te Pouri. Ka kitea hoki te rewanga o Matariki i roto i a ia	The work is with the star Te Apura, which drives away the wind of the Pouri period. The Pleiades are also seen high in the sky
12. Te Rehu	April	Ko te topa hanga o Matariki	The Pleiades descend (in the sky)
13. Te Whakaau (?)	May (15 days)	Ko te haka hua te kai; te ruiruinga o Matariki	Food grows; the Pleiades are sown

The second classification into two groupings was recorded by the same person after the three-period groupings. In the two-period classification the recorder gave the names of the English months, which in his opinion corresponded with the native moons. He met the difficulty of placing the extra native month by dividing May and giving 15 nights to *Pipiri* and 15 to *Whakaau.* At the same time he transposed the order of these two half-

months from that which he had previously given in the three-period classification. The native text is quoted in full, as it contains remarks about the Pleiades which are significant (Table 19).

Table 19. Rakahangan Annual Cycle, Two-period Classification

Te tau marama a to tahito.

"No Hahake mai te tau marama. Na Erengai i ka mai te tuaroa i karangaia e to tahito e hitu ia marama. Tera tona tikaanga e ono marama e te wahanga." (The count of months according to the ancients. From *Hahake* came the count of months. *Erengai* brought [*ka*] or instituted the *tuaroa* [long period], which was said by old people to consist of seven months. The meaning of this is six months and a part of one.)

"Te tuapoto kua karangaia e to tahito e ono marama. Tera tona tikaanga e rima marama e te wahanga." (The short period [*tuapoto*] was said by the old people to comprise six months. The meaning of this is five months and a part of one.)

Te tuaroa		Te tuapoto	
Te Takaonga	November	Whakaau	May (15 days)
Te Hiringa-kerekere	December	Unuunu	June
Te Hiringa-ma	January	Oroamanu	July
Te Utua-mua	February	Paroro-mua	August
Te Utua-muri	March	Paroro-muri	September
Te Rehu	April	Muriaha	October
Te Pipiri	May (15 days)		

The long period (*tuaroa*) thus comprises the *Pouri* and *Au po* periods of the previous classification. The month names follow the same order except that *Pipiri* has displaced *Whakaau* in following the April moon, *Te Rehu.* The following remarks are made concerning *Pipiri:* "Te Pipiri 15 po no May. Te takahanga ia Matariki ki raro." (*Pipiri* has 15 nights belonging to May. The Pleiades are situated low in the sky.) With regard to *Whakaau* in the short period the recorder states, "Te Whakaau 15 po no May. Koia te ruiruinga ia Matariki." (*Whakaau* has 15 nights belonging to May. In this [month] is the sowing of the Pleiades.) It will be observed that the short period corresponds with the period of the *mata tonga* except that *Whakaau* has changed places with *Pipiri.*

Of two lists copied by Savage from the book of Aporo-ariki of Manihiki, one is identical with that already given in the two-period classification, but the other (Table 20) differs in some of the names and their sequence and in the omission of the 13th name, *Pipiri.* In this different list, each month is given a star with the expression, "Tona etu i runga ko . . . ." (Its star above is . . . .) The sequence of the list in Table 19, commencing from *Whakaau,* is shown in parentheses in the second column of Table 20.

Table 20. Twelve-month Cycle, Comparison and Stars

Month Name	Sequence (Table 19)	Star
1. Akaau	Whakaau (1)	Matariki (Pleiades)
2. Kauunu	Unuunu (2)	Takurua
3. (Missing)		
4. Reu	Te Rehu (12)	Au-ma-Tangaroa
5. Manu	Oro-a-manu (3)	Vero-mata-utoru
6. Paroro-mua	Paroro-mua (4)	Ika-vaerua
7. Paroro-muri	Paroro-muri (5)	Ngatarava
8. Iringa-te-rangi	Hiringa-ma (9)	Tuaika
9. Iringa-kerekere	Hiringa-kerekere (8)	Ngana-kau-kupenga
10. Kautua-kerekere	(Utua-mua) (10) (Utua-muri) (11)	Uapoe
11. Takaonga	Takaonga (7)	Teruapa
12. Miria	Muriaha (6)	Tautoru

After the total lack of any correspondence with the western nights of the moon, it is surprising to find that some of the month names correspond to those of Samoa (22). Of these, the two most significant are *Paroro-mua* and *Paroro-muri.* In Samoa the *palolo* is an edible marine worm that appears at the end of the second or beginning of the third quarter of the lunar month that includes October. It is thus a definite period in the Samoan calendar. This marine worm does not appear in Manihiki and Rakahanga. The *Paroro* month names must have had a western origin. The star of the first *Paroro* month is *Ika-vaerua* which means "spirit fish" or "fish without a material body." As the *paroro* came from the sea, it could be spoken of as an "ika." It may be that the memory of a fish associated with the first *Paroro* month has led to the local naming of a star that was visible in that month.

Aporo-ariki's list supports the *tuapoto* division of the two-period classification in placing *Whakaau* as the first month, followed by *Unuunu.* The further definite statement that the Pleiades (*Matariki*) (Table 21) are seen in *Whakaau* also proves that in the three-period classification *Pipiri* and *Whakaau* have been transposed in sequence, and the remarks concerning the Pleiades go with the month names. *Whakaau* should thus be the first month at the beginning of the *Mata-tonga* period and *Pipiri* the 13th month at the end of the *Au-po* period.

Table 21. Observations Regarding the Pleiades in a Sequence of Four Months Ending with Whakaau

NATIVE MONTH	EUROPEAN MONTH (?)	OBSERVATION	TRANSLATION
Utua-muri	March	Te rewanga o Matariki	The Pleiades are high in the heavens
Te Rehu	April	Te topahanga o Matariki	The Pleiades descend
Pipiri	May (part)	Te taka anga (or taka-hinga) o Matariki ki raro	The falling of the Pleiades below (the horizon)
Before Whakaau		Te whakaauanga o Matariki	The Pleiades are seen as a group
Whakaau	May (part)	Te ruiruinga o Matariki	The sowing of the Pleiades

From astronomical observations it is known that the Pleiades are fairly high in the evening sky in the month of March, and they get lower and lower during April. E. H. Bryan informs me that in Hawaii, for the year 1931, they were last seen in the evening sky on May 7. They were in conjunction with the sun on May 20 and were not seen again until June 5, when they reappeared in the eastern sky before sunrise. The sequence of the appearance of the Pleiades as given in the above table was thus based on practical observation and fixes the times of the native months, but the European months given are only approximate, as the lunar months do not agree with calendar months. The lunar month which was divided between *Pipiri* and *Whakaau* covers part of May and part of June.

Any doubt as to the sequence between *Pipiri* and *Whakaau* is settled by the following from Aporo-ariki's book:

1. Akaau te marama, tona etu i runga ko Matariki. Tera te tako:
"Matariki e—Matariki pu—Matariki tu—
Matariki i tokerekere ia 'i te mata o Avatea.
Ko koe ra te mata-ono kapua ki te rangi,
Te vaine i taka ia'i ite rua o te ra Tua-nuku tue i marie.

Ko koe ra e te etu mata-ono."

1. *Whakaau* the month, its star above is the Pleiades. There is the chant:
O Pleiades—Pleiades *pu*—Pleiades *tu*—
The Pleiades which sparkle on the face of the Dawn.
You are the six-eyed cloud in the sky,
The woman who descended into the pit of the sun beyond the earth but emerged scatheless.
You are the six-eyed star.

It is clear that the *whakaauanga* or morning rising of the Pleiades in June was the guide to the commencement of the year, in the month of *Whakaau*. The morning rising of the Pleiades is the only definite sign given by which the annual cycle of months could be inaugurated. Other stars are mentioned with each month, but they were merely seen in those months and there are no details concerning their appearance or disappearance as with the Pleiades. No mention is made of the Pleiades in the November-December period, so that the evening rising of that constellation was of no significance in the Rakahangan calendar. After *Whakaau* was inaugurated

by the morning rising of the Pleiades on approximately June 5, the *tau marama* or sequence of months followed automatically with the rising of each new moon. From an astronomical point of view, the morning rising of the Pleiades in June is much more definitely defined than the evening rising in November. In May the Pleiades disappear and cannot be seen at any time of the night. Their reappearance in June in the eastern sky before sunrise is thus the reappearance of that which was lost and is hailed with singing and dancing. According to the chant, the Pleiades represent the woman who descended into the pit of the setting sun in the west and who, after traveling around the *tua-nuku* (back of the earth), emerges again in the east scatheless after her great adventure and with her six eyes sparkling on the face of the dawn.

THE RAKAHANGAN INTERCALATION

Both the native recorders, Haumata-tua and Aporo-ariki, in endeavoring to reconcile the Rakahangan 13-month cycle with the 12 European calendar months, wrote that though the old people (*to tahito*) stated that the long season consisted of 7 months, the meaning was 6 months and a part, and the short season of 6 months meant 5 months and a part. They then divided the calendar month of May between the two months *Pipiri* and *Whakaau,* giving each 15 days. In the use of the term May it may be inferred that the lunar month of May-June was meant. If, however, a full month of 30 days was divided regularly between two of a series of 13, and the remaining 11 were lunar months, the result would be a regular cycle of 12 lunar months with no system of intercalation. Such an interpretation is untenable.

As the short month, *Pipiri,* precedes *Whakaau,* it must commence with the new moon after the previous regular lunar month of *Te Rehu,* in which the Pleiades are descending. In *Pipiri* the Pleiades either sink below the western horizon or have disappeared. The following *Whakaau* month is indicated by the rising of the Pleiades, and as *Pipiri* is a short month, *Whakaau* cannot very well wait for the next new moon on all occasions. The problem is the division between *Pipiri* and *Whakaau* so that a system of intercalation may be possible. An indication is obtained from a statement by Best (2, p. 12) which shows that a similar system was known in New Zealand in addition to the one more widely used:

> Tutakangahau, of Tuhoe, clearly explained the fact that in the Mataatua district the appearance of the Pleiades on the eastern horizon before sunrise was the sign awaited as a token of the new year. He made a peculiar statement that looks as though the year in that district commenced, or sometimes commenced, in the middle of the lunar month. If this was so it was a very singular procedure. He remembered that each month had thirty nights, but that the first month, Pipiri, had fifteen nights only "of its own," its other fifteen nights formed half of the second month, Hongonoi. Hongonoi was composed of these fifteen nights and fifteen others "of its own." The third and following months were made up in a similar manner. Unfortunately, I lost the oppor-

tunity of obtaining further light on the subject, and so am still in the dark as to what the old man meant. He was a man of much knowledge, and the most trustworthy of authorities on old-time lore.

These remarks support the Rakahangan statements. Though *Pipiri* was the 1st month in the Maori calendar and the 13th month in the Rakahangan, they were both months evidently in the lunar month of May-June. In the Rakahangan calendar the rising of the Pleiades ended in the *Pipiri* month, and in the Mataatua calendar of New Zealand it commenced the *Pipiri.* It is significant that the Maori 13th month was also known as *Te tahi-o-Pipiri.*

As a working hypothesis based on the Rakahangan observations concerning the Pleiades, it is held that the morning rising of that constellation ended the *Pipiri* month and commenced the *Whakaau.* The Pleiades descend from the western sky on about May 7, which is in the month of *Te Rehu.* This is borne out by Table 22, except in the intercalated years. The next new moon after *Te Rehu* is taken as the commencement of *Pipiri,* which continues to June 4, whereas *Whakaau* commences with the morning rising of the Pleiades on approximately June 5 and finishes out the lunar month. In Table 22 the new moon commencements of the lunar months are given and, in parentheses, the number of days in *Whakaau* and *Pipiri.*

Table 22. Rakahangan Annual Cycle of 13 Months.

NUMBER	MONTH NAME	1927-8	1928-9	1929-30	1930-1	1931-32
1.	Whakaau	.....	June 5 (12)	June 5 (2)	May 28 (29)	June 5 (11)
2.	Unuunu	.....	June 17	June 7	June 26	June 16
3.	Oroamanu	.....	July 17	July 6	July 25	.....
4.	Paroro-mua	.....	Aug. 15	Aug. 5	Aug. 24	.....
5.	Paroro-muri	.....	Sept. 14	Sept. 3	Sept. 22	.....
6.	Muriaha	.....	Oct. 13	Oct. 2	Oct. 21	.....
7.	Takaonga	.....	Nov. 12	Nov. 1	Nov. 20	.....
8.	Hiringa-kerekere	.....	Dec. 12	Dec. 1	Dec. 20	.....
9.	Hiringa-ma	.....	Jan. 11	Dec. 31	Jan. 18	.....
10.	Utuamua	.....	Feb. 9	Jan. 29	Feb. 17	.....
11.	Utuamuri	.....	Mar. 11	Feb. 28	Mar. 19	.....
12.	Te Rehu	April 21	Apr. 9	Mar. 30	Apr. 18	.....
13.	Pipiri	May 19 (17)	May 9 (27)	Apr. 28 (30)	May 17 (19)	.....

In the cycle 1927-28 the last month, *Pipiri,* commenced with the new moon on May 19, 1928, and ran to June 4, making a month of 17 days. The 1928-29 cycle commenced with *Whakaau* on the rising of the Pleiades on June 5, 1928, and finished out the lunar month to June 16, thus giving *Whakaau* 12 days. Thus the *Pipiri* of the previous cycle and *Whakaau* divided a lunar month of 29 days between them in respective proportions of 17 and 12, and not 15 and 15. The last month of the 1928-29 cycle commenced with the new moon of May 9, 1929, and ran for the long period of 27 days before the Pleiades rose. The *Whakaau* of the following cycle, 1929-30, thus had only 2 days before the next new moon rose to usher in

Unuunu on June 7. The short *Whakaau* in 1929 led to the early commencement of the last month of the cycle on April 28, 1930, and *Pipiri* ran a full lunar month of 30 days without being stopped by the rising of the Pleiades. Nothing now remained but to commence the next cycle of 1930-31 with *Whakaau* on the following new moon on May 28, 1930. In this month the Pleiades rose on the 9th night, but the *Whakaau* month ran on the orthodox manner after the rising of the Pleiades to the end of the lunar month of 29 days. The intercalation thus consisted of bringing the two short months of *Pipiri* and *Whakaau* up to the value of two lunar months, when the Pleiades did not rise in the lunar month commenced by *Pipiri.* The principle is similar to the New Zealand method of adding a 13th month when the Pleiades do not rise in the 12th month of the cycle. The intercalation restored the balance between the lunar months and the seasons. At the close of the 1930-31 cycle, *Pipiri* and *Whakaau* again divided a lunar month between them. *Pipiri* closed the cycle with a month of 19 days, whereas *Whakaau* commenced the 1931-32 cycle with the remaining 11 days.

In Table 23 the range of the Rakahangan lunar months has been worked out in sequence over a cycle of 19 solar years. The range is estimated from the earliest new moon to the end of the lunation commencing with the latest new moon. The exceptions are in the 1st and 13th months.

Table 23. The Range of Lunar Months

NUMBER	NAME	CALENDAR RANGE	NUMBER OF DAYS	CALENDAR CORRELATION	NATIVE ATTRIBUTION
1.	Whakaau	May 26 to July 3	39	June	(May)
2.	Unuunu	June 7 to Aug. 1	56	June-July	(June)
3.	Oro-a-manu	July 5 to Aug. 30	57	July-Aug.	(July)
4.	Paroro-mua	Aug. 3 to Sept. 28	57	Aug.-Sept.	(Aug.)
5.	Paroro-muri	Sept. 1 to Oct. 28	58	Sept.-Oct.	(Sept.)
6.	Muriaha	Oct. 1 to Nov. 26	57	Oct.-Nov.	(Oct.)
7.	Takaonga	Oct. 30 to Dec. 26	58	Nov.-Dec.	(Nov.)
8.	Hiringa-kerekere	Nov. 29 to Jan. 24	57	Dec.-Jan.	(Dec.)
9.	Hiringa-ma	Dec. 28 to Feb. 23	58	Jan.-Feb.	(Jan.)
10.	Utua-mua	Jan. 27 to Mar. 25	58	Feb.-Mar.	(Feb.)
11.	Utua-muri	Feb. 26 to Apr. 23	58	Mar.-Apr.	(Mar.)
12.	Te Rehu	Mar. 28 to May 23	57	Apr.-May	(Apr.)
13.	Pipiri	Apr. 26 to June 4	40	May	(May)

It is apparent that with the exception of split months and the intercalated 13th month, the month names in any Polynesian calendar have a range of 57 or 58 days in a cycle of 19 years. Some names, such as *Takaonga,* extend into three calendar months, as from October 30 to December 26. As, however, the month can only occupy two days of October at the most, October may be eliminated and the general grouping of Takaonga may be considered as November-December. The fallacy of attempting to identify

the Polynesian lunar months with one calendar month is evident. They must be correlated with double calendar month names as given in the "Calendar Correlation" column of Table 23, except perhaps in the split 1st and 13th months which extend only 9 and 10 days over a full lunar month. In the "Native Attribution" column it is seen that Haumata-tua was correct as to his sequence of calendar months in so far as they agree with the first calendar months of the calendar range occupied by the native lunar months. The mistake in *Whakaau* is due to splitting the calendar month of May, when it was the lunar month range of May-June that should have been divided, May going to the 13th month, *Pipiri,* and June to the 1st month, *Whakaau,* of the next cycle.

It will be observed that at different periods in a 19-year cycle the second calendar month of one lunar month will become the first calendar month of the succeeding lunar month. Thus *Paroro-mua* (August to September) will at one period be in the calendar month of September and at another period the next lunar month of *Paroro-muri* (September to October) will also be in September. The coming of the *tomore* fish is associated with *Paroro-mua*; but if the fish comes regularly in the calendar month of September, the result will be, from a native point of view, that the *tomore* arrives in some years in *Paroro-mua* and in others in *Paroro-muri.* Such occurrences may have constituted one of the factors which led to variation in the sequence of similar lunar month names in different localities.

The Rakahangan information establishes a hitherto unrecorded method of correlating the lunar cycle with the Pleiades year. It is known from various writings that the lunar cycle was used throughout Polynesia and that in most areas the appearance of the Pleiades in the morning or evening sky gave the sign for the commencement of the new year. None of the early writers who had the opportunity of obtaining information from Polynesian astronomers have recorded how the Polynesians corrected their annual lunar cycle to prevent a dislocation of the seasons. Best (2) has recorded that the Maori year commenced with the first new moon after the morning rising of the Pleiades. He recorded lists of cycles of 12 months and some of 13 months. Though he did not follow the matter up, it may be inferred from his work that when the Pleiades did not rise in the 12th lunar month of the cycle, the Maoris had to delay the commencement of the next cycle for a whole lunar month. This meant the addition of an extra lunar month to the 12-month cycle. The intercalation of a 13th month was decided not by mathematical calculations but by the simple rule that the new year could not start until the first new moon after the morning rising of the Pleiades. The rule of not commencing the new year until the first new moon after the astronomical sign applies equally well if the evening

appearance of the Pleiades is taken as the sign. The strict observation of the rule would automatically lead to the intercalation of a 13th month in some cycles. Under this system, the usual year of 12 lunar months would consist of 354 days and at intervals a 13-month year of 383 or 384 days would prevent the dissassociation of the lunar month names with the seasons. The range of variation in the year was one lunar month.

The Rakahanga system, if I have analyzed the evidence correctly, differs in that the new year commenced on the actual morning rising of the Pleiades. This led to the splitting of a lunar month with the result that the calendar was a constant 13-month cycle though the lengths of the two split months varied. Though the two months were contiguous and split one lunar month between them, they did not belong to the same cycle, one being the last of one cycle and the other being the first of a new cycle. The total of the two split months in the same cycle amounts to more than a lunar month. The total taken over a period of 19 years ranged from 31 to 49 days. Thus in the Rakahangan system a correction was made every year and the number of days in a year ranged from 356 to 372. The Rakahangan year was never more than 9 days longer or shorter than the solar year, whereas the New Zealand year varied from 11 days shorter to 19 days longer. Rakahanga resembles New Zealand in observing the morning rising of the Pleiades. The Rakahangan system of the constant split 13th month is more accurate than the intercalated 13th month attributed to New Zealand, but there are indications that the split 13th month was also known in New Zealand.

STARS

The navigation stars (*te vairanga kaveinga*) were listed as follows by Stephen Savage from the manuscript of Aporo-ariki:

1. Tauira-te-ao
2. Tauira-te-marama
3. Tauira-te-etu (hetu)
4. Tauira-te-kaveinga
5. Tauira-rangi-o-Avatea
6. Etu-kura
7. Ngamau
8. Okianga
9. Matanui

The term "kaveinga" means "direction to steer by," and was consequently applied to the European compass when it made its appearance. A star is *hetu* but is written as *etu* by Aporo. Star 7 should be *Nga-mahu* or *Na-mahu*. An explanation given to me was, "E rua Mahu, e rua ata." (There are two Mahu, with two shadows.) It was applied to the Magellan clouds which pointed out the direction in which to steer between Rakahanga and Manihiki.

Stars of the month are given in Table 20. The appearance of the Pleiades is given on page 226. Another list gives *Tautoru* as seen in the *Utuamua* month, *Te Ahura* in *Utuamuri*, and *Whaniu* as the main star of the *Pouri* period extending from November to January.

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PLATE LEGENDS

PLATE 1. HOUSES AND IMPLEMENTS.

A. Old-type house with side supporting posts and crossbeams, low eaves, and open walls with coconut leaf screens let down on left; sole survival of type, on Rakahanga.

B. Houses of Rarotongan type on Rakahanga, with lauhala thatch: 1, house with end sloping out to form veranda, closed walls of horizontal pieces of wood; 2, house with vertical ends and open walls, used as assembly house.

C. Thatching implements: 1, roof sheet needle (*tuiau*) of *ngangie* wood (C. 2811) (fig. 10); 2, thatching needle of *ngangie* wood (C. 2810) (fig. 11).

D. Hand graters (*tuai*) of pearl shell, front surface with grating edge up: 1, short grater (C. 2788) (fig. 20, *a*); 2, grater (C. 2784) with serrated edge, length, 6.5 inches and greatest width, 1.4 inches; 3, grater (C. 2783) with serrated edge, length, 7.1 inches and greatest width, 1.2 inches; 4, grater (C. 2785) with part of shell hinge included in grip end, length, 8.1 inches and greatest width, 1.6 inches.

E. Wooden food pounder (*reru*) with knobbed handle (C. 3020) (fig. 21).

PLATE 2. COCONUT LEAF MATS.

A. Sitting mat (*pora*) of open leaflets plaited in check (C. 3074), from two midrib strips shown in back view of lower edge, finished above with spaced three-ply braid: width at top, 27 inches; width at bottom, 33 inches; depth, 20 inches.

B. Wall screen (*pataro*) or sitting mat (*pataro noho*) (C. 3109) formed of leaflets from both sides of unsplit midrib at lower edge: extra leaflets introduced; leaflets kept closed; horizontal rows of twilled-twos formed in lower part, followed by vertical twilled-twos, then horizontal twilled-fours and twilled-threes and finally check; side edges formed by upward half-turns on left and direct bends on right; three-ply braid finish at top commencing from left with braid tail tucked back on right; width at top, 30 inches; width at bottom, 35 inches; depth, 27 inches.

C. Oven cover (*pataro umu*) (C. 3108): twisted two-strip commencement with closed leaflets; technique from bottom, horizontal row of dextral check, horizontal sinistral twilled-two, horizontal dextral check, vertical twilled-twos, horizontal twill and finishing rows of check; three-ply braid finish at upper edge with braid tail tucked through plaiting on right; width at top, 18.5 inches; width at bottom, 30 inches; depth, 19 inches.

PLATE 3. COCONUT LEAF MAT AND COOKING RECEPTACLES.

A. Large sitting mat (*tapakau*) (C. 3075) made of separate leaflets plaited in on either side of three-ply mesial braid 45 inches long: closed leaflets plaited in horizontal and vertical twills converted to check at outer edges and finished off with three-ply braid; under surface shown to illustrate mesial braid commencement; length of braid finishing edges, 42 inches; width of each half, 23 inches.

B. Large *puraka* cooking receptacle (*raurau papa*) (C. 3072): simple two-strip commencement, open leaflets, check plait; leaflet left out on either side to act as tying strip when upper end folded down over food; top finishing end has leaflets tied together in pairs; top width, 16 inches; bottom width, 11 inches; length, 22 inches; width of wefts, 1.2 inches.

C. Fish receptacle (*raurau to ika*) (C. 3069): roughly made from two strips with open leaflets in check; free leaflets left out on ends of midrib strips to serve as ties; ends of leaflets tied at upper end into overhand knots; depth and width, about 10 inches.

D. Small cooking receptacle (*raurau kapukapu*) (C. 3069): simple two-strip commencement, open leaflet, check plait; ends of leaflets brought around back of midrib strips in two sets after doubling receptacle over, and tied in reef knot; width, 9.5 inches; depth, 6.5 inches.

PLATE 4. COCONUT LEAF PLATTERS, RECEPTACLES, EYE SHADE, AND BASKETS.

A. Serving platters, *pite* receptacles, and eye shade. 1, ordinary serving platter (*raurau*) (C. 3073): simple two-strip commencement, open leaflets, check plait, braid finish; bottom width, 12 inches; top width, 10 inches; depth, 13 inches. 2, fish platter (*raurau rava ika*) (C. 3064): simple four-strip commencement, open leaflet with pared edges, check plait, braid finish; bottom width, 12 inches; top width, 9 inches; depth, 15 inches; weft width, 0.6 inch or 0.7 inch. 3, modern plate platter (*raurau mereki*) (C. 3073): simple two-strip commencement, open leaflet, check plait, braid finish produced as two free tails which are tied behind midrib strips; 8 inches by 8 inches. 4, four-cornered receptacle (*pite pupu*) (C. 3069): simple two-strip commencement, open leaflet, check plait, braid finish; width, 8 inches; depth, 5 inches. 5, pointed receptacle (*pite pahua*) for *Tridacna* shellfish (C. 3070): technique similar to *pite pupu,* but point formed instead of corners; top width, 7.5 inches; depth, 7 inches. 6, eye shade (*taumata*) (C. 3071): midrib strip carrying six open leaflets, check plait; width, 17 inches; depth, 6 inches.

B. Round baskets. 1, introduced basket (*tongini*) (C. 3067): open leaflet, check plait, and single looped handle; rim dimensions, 13.5 inches by 10 inches; depth, 8.5 inches; width of wefts, 1.9 inches. 2, local basket (*kete*)

(C. 3066), side view with rim above, showing two braids from bottom finish tucked through plaiting at ends: twisted two-strip commencement, closed leaflet, horizontal twilled rows; rim not quite circular; diameters, 19 inches and 16 inches; depth, 7 inches. 3, local basket (*kete*) (C. 3065), bottom view showing concentric narrowing by combining pairs of wefts as single elements: braid finish forms transverse line; rim diameter, 11 inches; greatest diameter below rim, 13.25 inches; depth, 6 inches.

PLATE 5. SATCHELS AND FANS.

A. Satchels. 1, coconut leaflet clothes satchel (*kete ngahengahe*): twilled technique with split leaflets braided together at rim and finished with three-ply braid at bottom; ornamented with wrapped splints, *tou* bast, and pearl-shell pendants; bottom width, 12 inches; rim width, 9 inches; depth, 7.8 inches. 2, two-cornered lauhala satchel (C. 3059): wefts, five to the inch; check plait with overlaid geometrical figures in red; serrated rim and single longitudinal handle; width, 10.5 inches; depth, 9.75 inches. 3, fine coconut leaflet satchel (C. 3059): two-cornered, twill plait, serrated rim, transverse handle; modern note, insertion of colored ribbons and rosette ornamentation. 4, four-cornered lauhala satchel (C. 3041): wefts, seven to the inch; check plait with overlaid geometrical figures; turned, even rim; single transverse handle; width of sides, 9.5 inches; width of ends, 2 inches; depth, 5.5 inches. 5, four-cornered square lauhala satchel (C. 2861), side view: wefts, six and a half to the inch; check plait with overlaid geometrical figures; seized rim; two longitudinal handles; rim, 7 inches square; depth, 5.75 inches. 6, four-cornered square lauhala satchel (C. 2861), end view showing overlaid ornamentation of ends as well as sides.

B. Fans. 1, fan (C. 3028) of white prepared coconut leaf: plaited in twilled-twos, finished in check, end fringe of *tou* bast dyed red; length, 2.75 inches; wooden handle, 4.25 inches long, 0.6 inch in diameter, with distal prolongation 6.25 inches long, thinned down to diameter of 0.3 inch proximally and 0.2 inch distally to afford support for white wefts which are doubled around in at their middle and crossed above in check; plaited portion, 6.3 inches long mesially and 6.75 inches long at widest part. 2, back view of fan similar but slightly larger (C. 3028): thinned distal prolongation of wooden handle projects beyond end of plaiting; plaiting, twilled-threes and twilled-twos. 3, two-section coconut leaf fan (C. 3027): longer upper midrib section, 13.75 inches long with seven pairs of leaflets; shorter under midrib section, 10 inches long with six pairs of leaflets; leaflets crossed in check over front of upper midrib, plaited in twilled-twos on either side of midrib, and finished off at end in check; total length, 23 inches; greatest width, 10 inches.

PLATE 6. PONCHO, KILT, AND MAT.

A. Plaited poncho (*tiputa*) of lauhala: nine or ten wefts to the inch; width, 19 inches; depth in mesial line to neck, 16.25 inches; neck opening square, 8 inches wide and 4 inches deep in position shown; fringe of *tou* bast dyed red, 3.75 inches deep.

B. Kilt (*tipora* or *mahere*) of a plaited band 40 inches long and 2.75 inches deep: six wefts to the inch; check; overlaid dyed wefts; fringe of *tou* bast 2.75 inches deep on lower border and 1.5 inches deep on upper border; lower pendent lauhala strips, 13 inches long and 2.5 inches wide.

C. Lauhala sleeping mat (*moenga*): double wefts in check plaiting, pattern in overlaid plaiting of *papa* material dyed red; length, 9 feet 6 inches; width, 7 feet 10 inches.

PLATE 7. CANOES AND BAILER.

A. Modern outrigger canoe of sawn planks, both ends pointed: two outrigger booms with float on left, right ends projecting beyond gunwale; indirect connection by means of two staves between booms and floats; bow and stern pieces to which ends of planks are nailed project above bow and stern covers; canoe small for one man, who is holding flying fish net.

B. Large modern plank outrigger canoe to seat two or more men: outrigger float turned to right for convenience in photographing; upward-projecting modern bow and stern posts; man in stern holds bamboo bonito rod and faces astern to illustrate method of bonito fishing.

C. Double canoe model (B.3475): three triangular sails and masts go with model; bows and sterns reversed in the two canoes; elaborate inlay with pearl shell; lauhala bulwarks; length, 36 inches; width between outside gunwales, 9 inches; depth from ground level, bow, 8 inches and stern, 8.25 inches.

D. Bailer (C.3022): length, 10.5 inches; front width, 5.3 inches; back width, 5.9 inches; side depth in front, 3.5 inches; side depth at back, 4.3 inches; mesial back depth, 6 inches; thickness, 0.15 inch in front, increasing toward back to 0.5 inch; back meets bottom and sides at sharp angles and is 1.1 inches thick; handle projects forward from upper part of back in mesial line and is 6.9 inches long, 1.3 inches wide, and 1.7 inches thick.

PLATE 8. FISH NETS AND NETTING NEEDLE.

A. Baited bag net (*kupanga tata*): hoop of *ngangie* wood about 14 inches in diameter; depth of net, 12 inches; suspensory cords from hoop; coral sinker.

B. Flying fish net (*kupanga maroro*) showing handle, frame, crossbar, and net (fig. 76).

C. Wooden netting needle (*hika*), 11.2 inches long (fig. 72).

PLATE 9. PADDLES AND HOOKS.

A. Paddles (*hoe*). 1, front view of paddle (C. 2924) showing typical blade with shoulder angles and long point: total length, 65 inches; blade length, 31.25 inches; greatest blade width, 5.1 inches; greatest width to handle junction, 4.5 inches; length of rib on back, 7.5 inches. 2, side view of paddle (C. 1444) showing handle rib on back of upper part of blade, projection on back of point, and longitudinal point concavity: total length, 67.25 inches; blade length, 30.6 inches; greatest blade width, 5.4 inches; greatest width to handle junction, 5.2 inches; length of rib on back, 5.8 inches. 3, front view of paddle (C. 1446) showing pearl shell inlay of discs and triangles: total length, 62.25 inches; blade length, 24.75 inches; greatest blade width, 5.15 inches; greatest width to handle junction, 3 inches; length of rib on back, 7.25 inches. 4, back view of paddle (6104) showing pearl-shell discs inlaid on handle rib: total length, 66 inches; blade length, 32.5 inches; greatest blade width, 4.8 inches; greatest width to handle junction, 9.1 inches; length of rib on back, 7.4 inches. 5, paddle probably erroneously attributed to Manihiki: total length, 68.5 inches; length of blade, 25.25 inches; greatest blade width, 9.6 inches; distance of greatest width from bottom, 4.5 inches; handle surmounted by flattened knob 2.1 inches wide and 1.1 inches thick; handle averages 1.5 inches in width and 1.4 inches in thickness and widens out to 2.8 inches at shoulders below, diminishes to 1.2 inches in thickness; blade, 2.3 inches wide at handle junction and 0.75 inch thick at side edges; blade diminishes in thickness in middle line from 1.2 inches at handle junction to 0.3 inch near lower end; side edges diminish in thickness from 0.75 inch at junction to average of 0.3 inch.

B. Pearl-shell hooks: 1, one-piece wide U-shaped hook (*tope*) (C. 2841) (fig. 83, *a*); 2, one-piece narrower U-shaped hook (*matau kiokio*) (C. 2844) (fig. 83, *b*); 3, one-piece circular hook (*koma*) (C. 2843) (fig. 83, *c*); 4, bonito hook, back view, showing two lashings of point, with hackle secured by turns of second distal lashing; 5, bonito hook, side view, showing form of point with proximal projection and two holes for lashings to shank, snood loop passing around base of point, characteristic shape of shank head, hole and head lashing to snood, snood slack between point and head; 6, bonito hook, front view, showing snood passing along mesial line in front of shank, hackle removed on left side (figs. 86-88).

C. Ruvettus hooks: 1, small hook (C. 2806) with pearl-shell point and wide bend, snood of three-ply braid (fig. 80); 2, large hook (C. 2805) with

wooden point and sharp bend, attached to three-ply twisted line of coconut fiber (fig. 77).

PLATE 10. WEAPONS AND ADZES.

A. Short *korare* club (C. 3019) made of *tou* wood, inlaid with pearl shell, and ornamented with three tassels of *tou* bast (fig. 109, *b*).

B. Long club (Am. Mus. Nat. History, S. 5113): pearl-shell discs inlaid and stuck on with some white substance; club fairly round in section but at head swells and is elliptical in section; total length, 60.5 inches; maximum width, butt, 3 inches and middle, 3.5 inches.

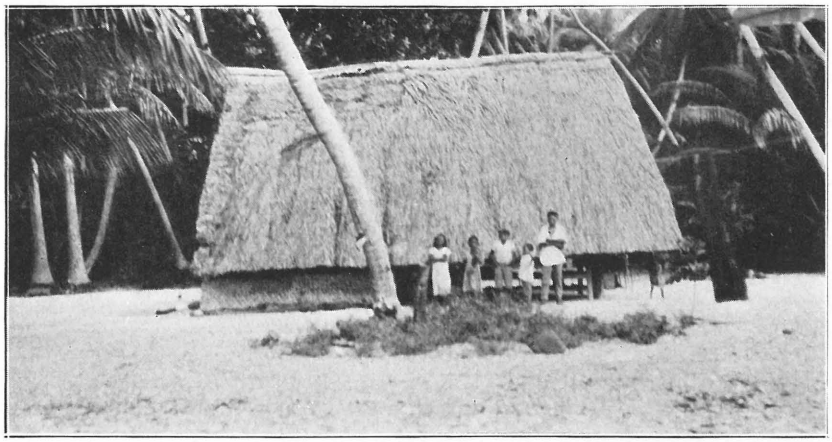
C. Adzes: 1, triangular adz (C. 2744) without tang, basalt covered with patina, 6 oz. (fig. 51); 2, triangular tanged adz (C. 2743), basalt covered with patina, 18 oz. (fig. 50); 3, quadrangular adz (C. 2742) with tang and bilateral lugs, grey basalt, 46 oz. (fig. 52); 4, adz (C. 2767) of *Tridacna* shell, lashed to movable socket to permit rotation of blade (figs. 54, 57); 5, adz (C. 2768) of *Tridacna* shell, simple hafting (figs. 54, 56).

PLATE 11. WOODEN GONGS AND HISTORICAL PLAY.

A. Double wooden gong (*koriro*) (6977): length of slot surface, 15.25 inches; width, middle of slot surface, 2.25 inches; width, ends of slot surface, 2.5 inches and 2.75 inches respectively; length of slot opening, 10 inches; width of slot opening, 0.9 inch to 1.1 inches; cavity depth, 2 inches. Ornamentation: six pearl-shell discs at either end, disc diameter, 0.4 inch; nicks cut on outer edges at ends, 17 to 20 nicks on each edge. Side view: depth in middle, 5.1 inches; depth, ends, 5.2 and 5.4 inches; transverse longitudinal groove midway down, constriction between two parts of gong; greatest thickness of each part, 3 inches; thickness at constriction, 2.1 inches. Slot also on under surface of lower part.

B. Wooden gong (C. 2838): diameter from slot to bottom, 3.8 inches; cross diameter, 3 inches; ends slope down and outward from slot surface, making upper length 14 inches and bottom length 16.5 inches; slot opening, 10.5 inches long and 1 inch wide; beating stick, 14.5 inches long, 0.9 inch in diameter, one end pointed.

C. Historical play, depicting discovery of Rakahanga: chief actor represents Huku, the discoverer; his body plastered over with light mud; wears headdress of netting and beard of coconut husk; plaited coconut leaf, supported as high as waist by cord passing over shoulder, represents canoe; coconut leaflet basket on ground represents upgrowth (*tapua*) fished up from bottom of sea to become land; play took place on village road.



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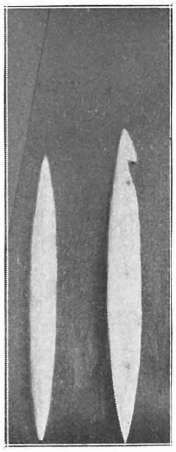

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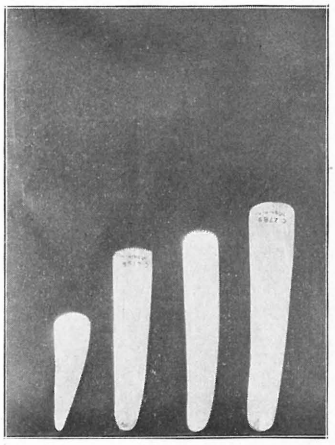

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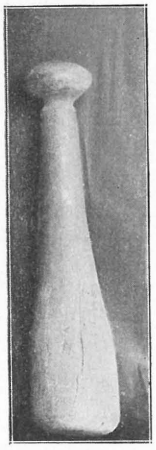

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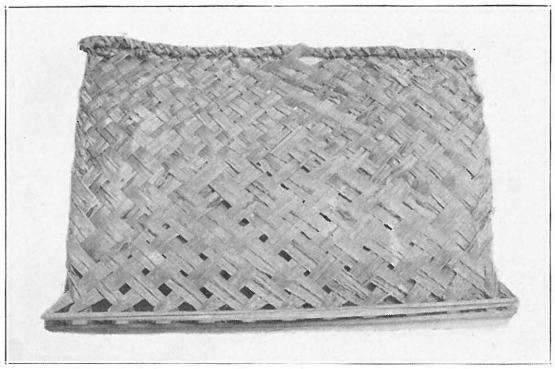

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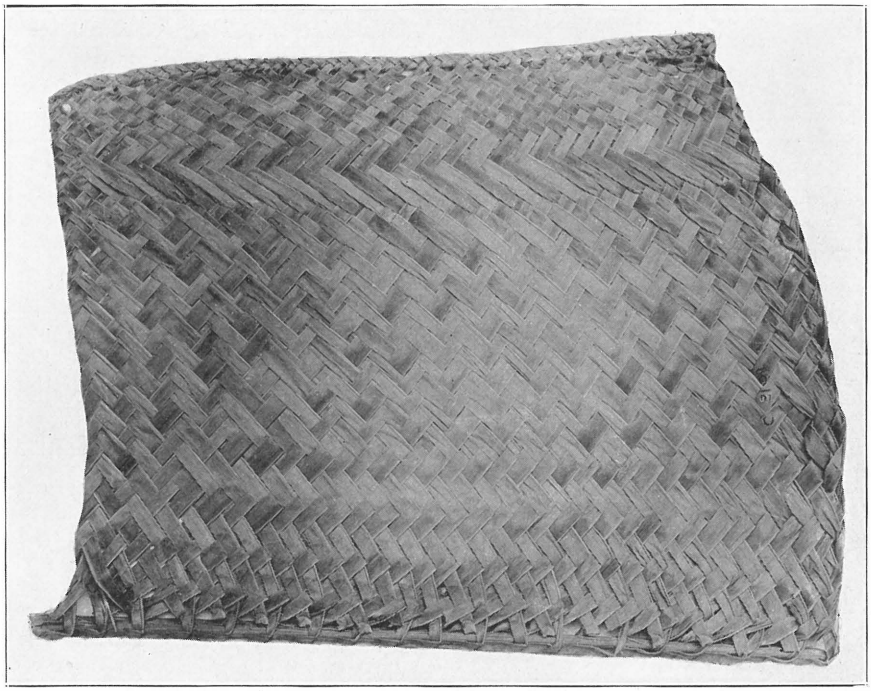

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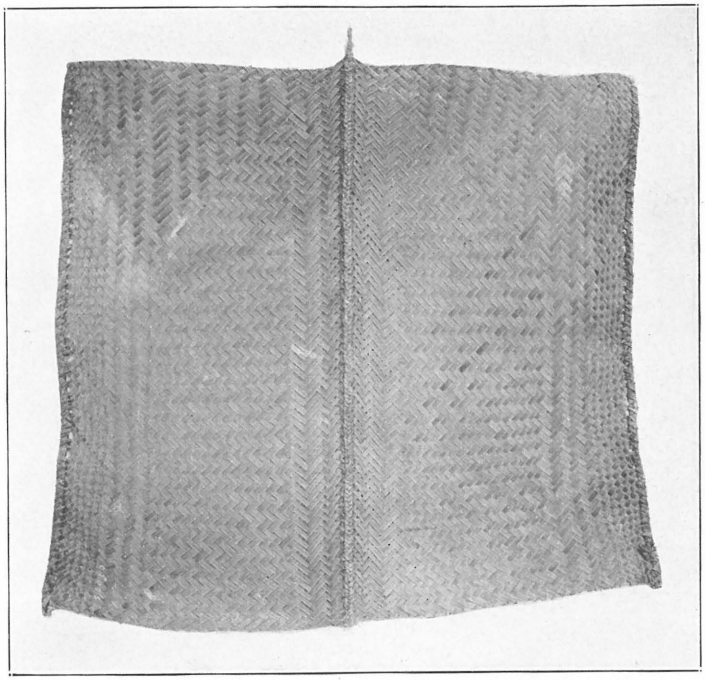
COCONUT LEAF MATS



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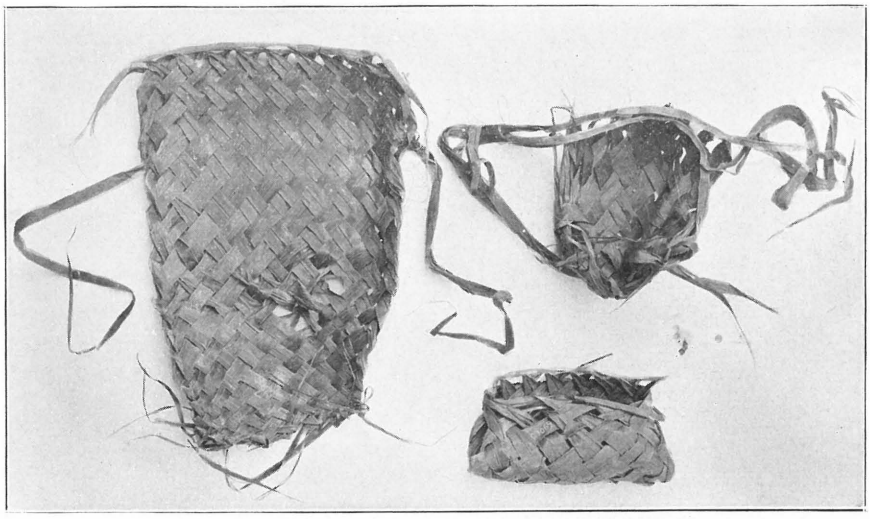

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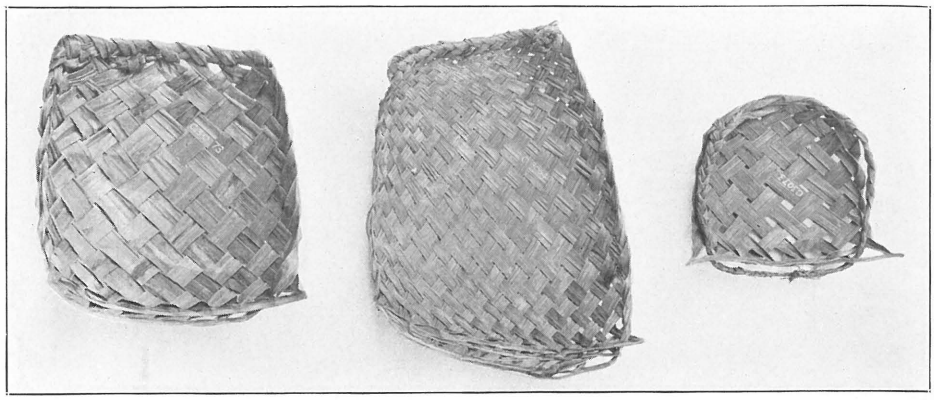
COCONUT LEAF MAT AND COOKING RECEPTACLES



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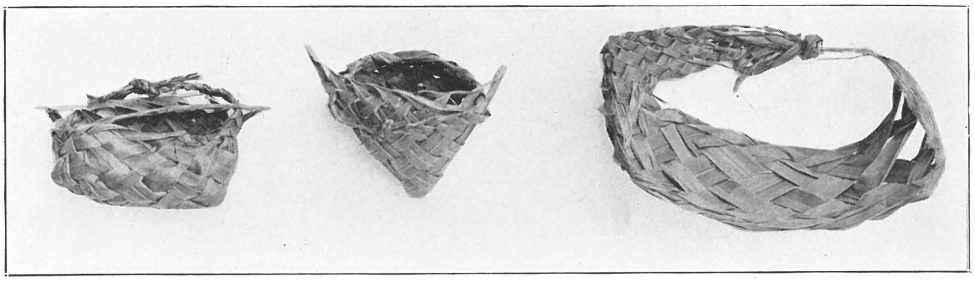

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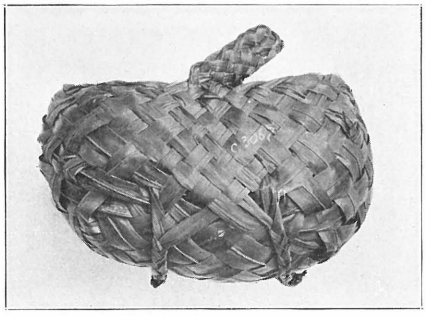

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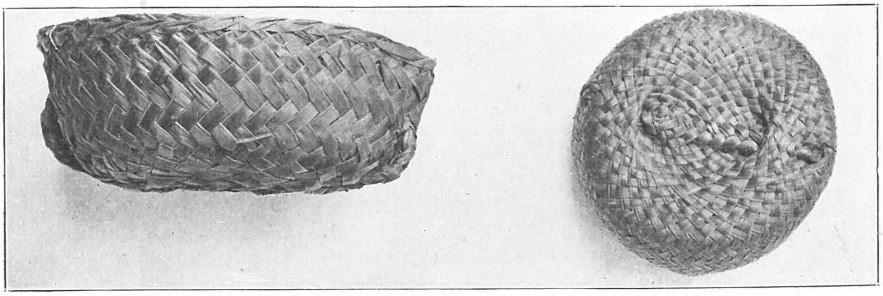

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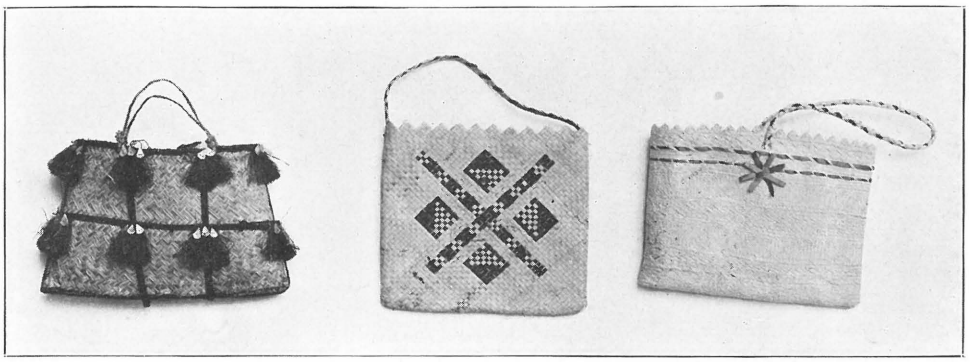
COCONUT LEAF PLATTERS, RECEPTACLES, EYE SHADE, AND BASKETS



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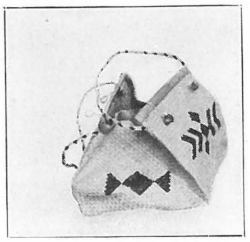

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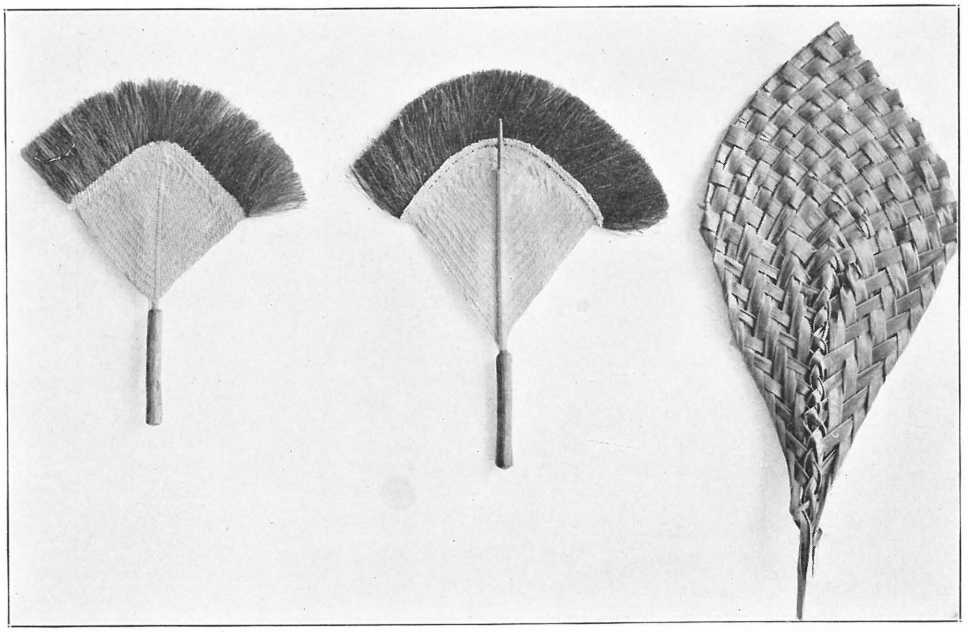

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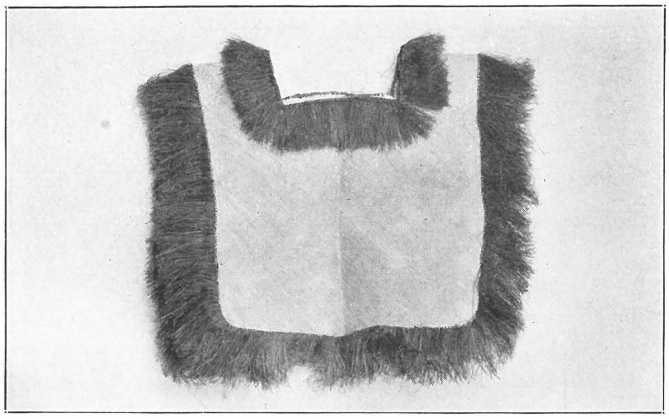
SATCHELS AND FANS



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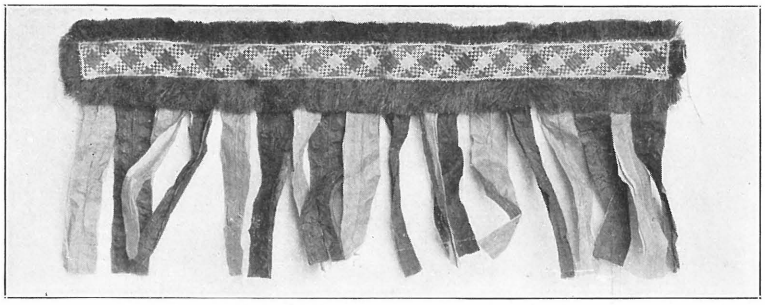

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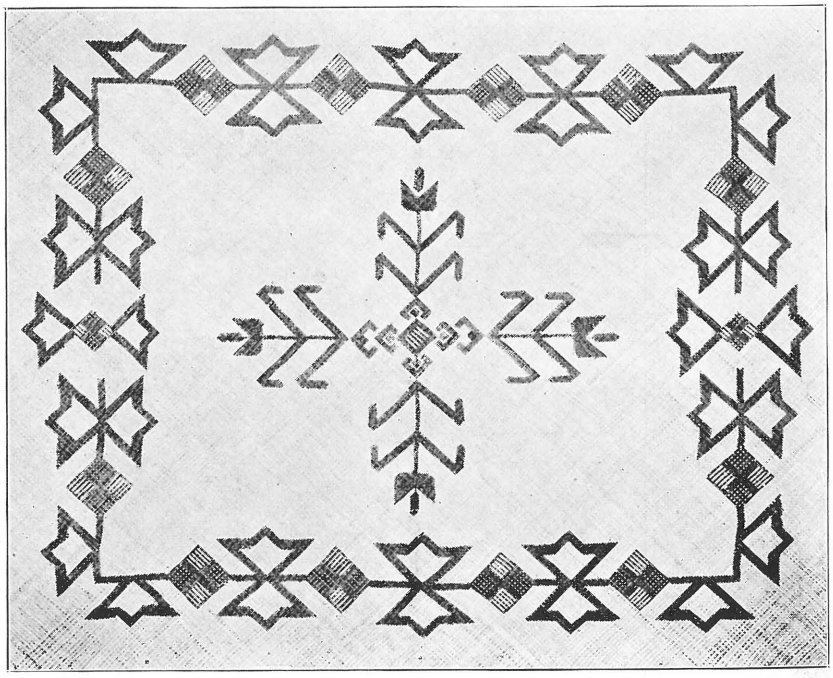

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PONCHO, KILT, AND MAT

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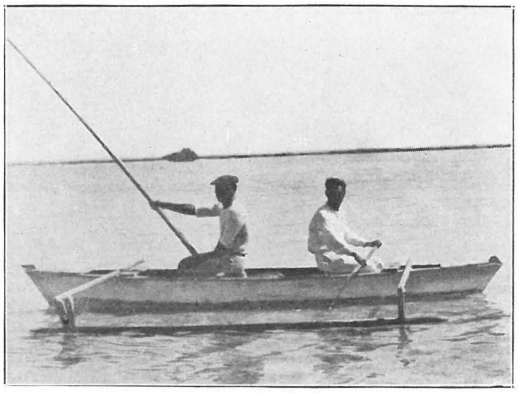

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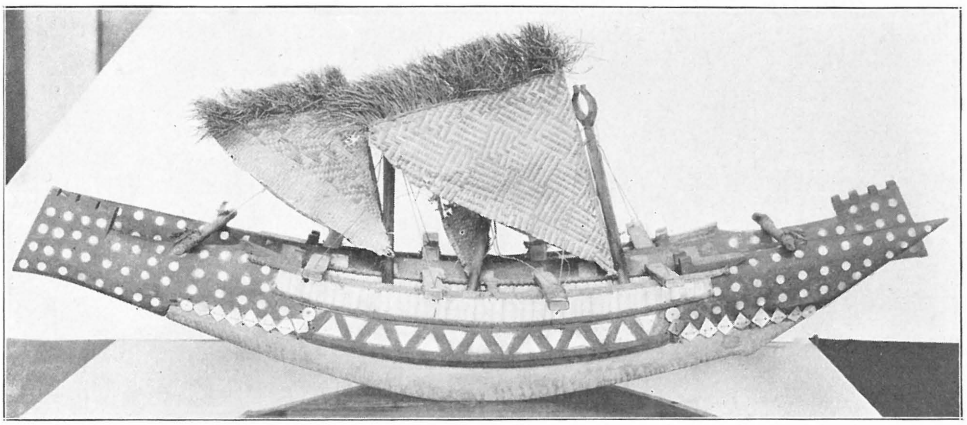

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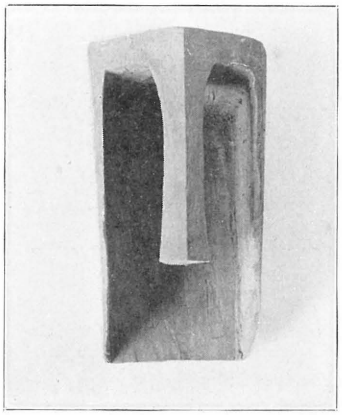

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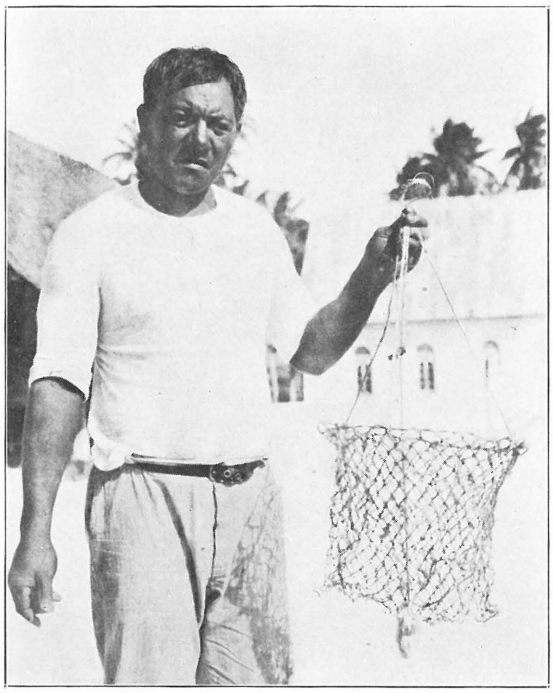
CANOES AND BAILER



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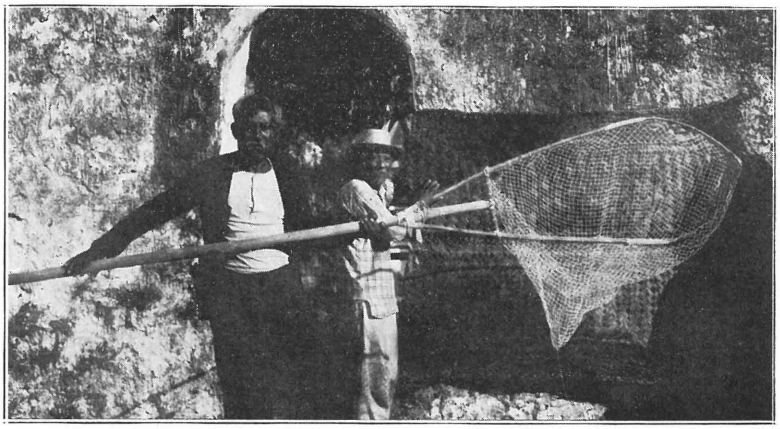

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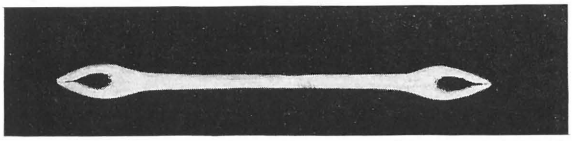

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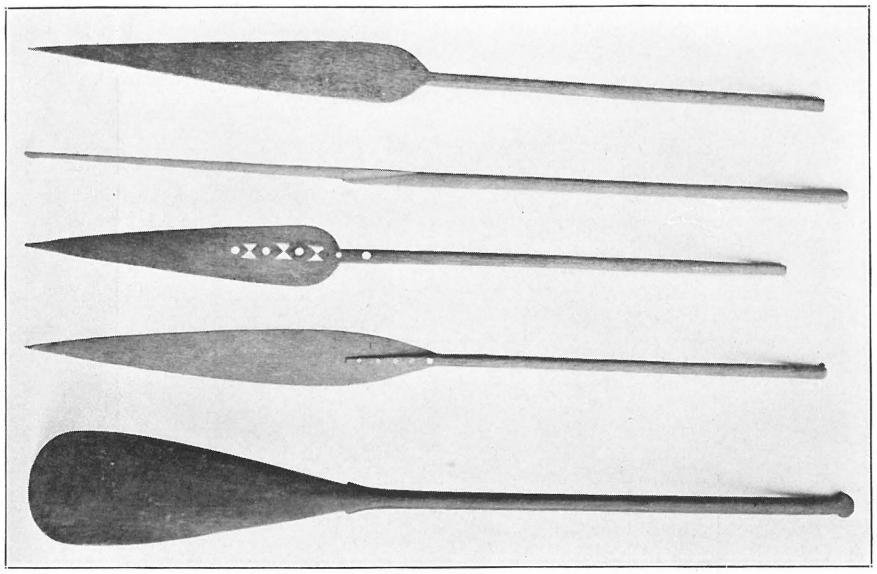
FISH NETS AND NETTING NEEDLE



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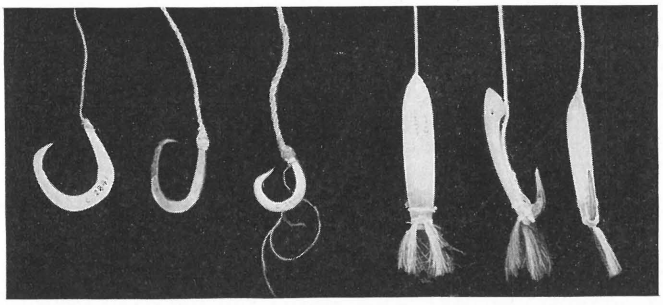

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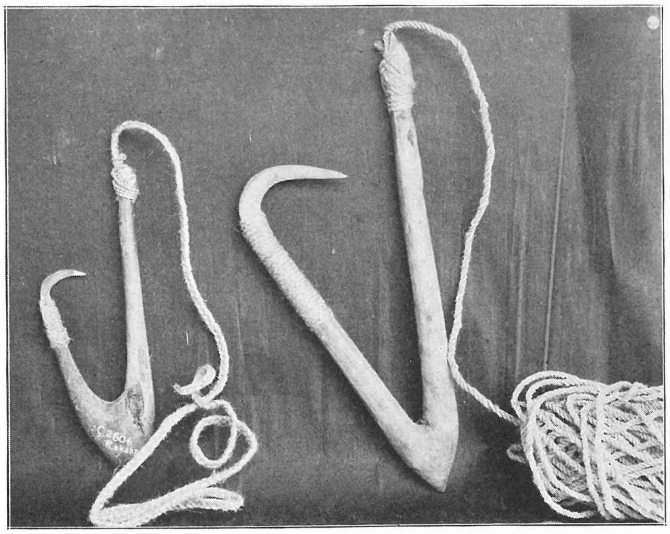

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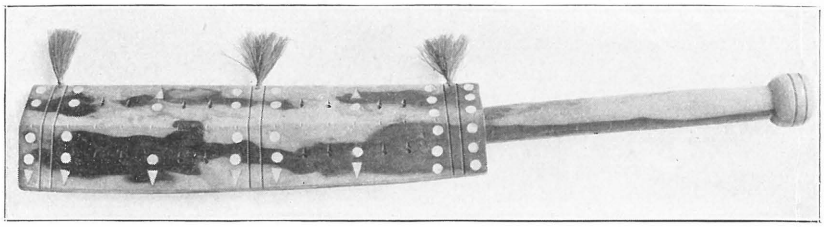
PADDLES AND HOOKS



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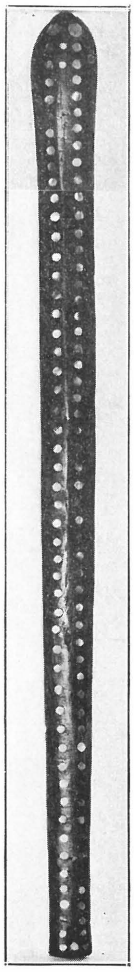

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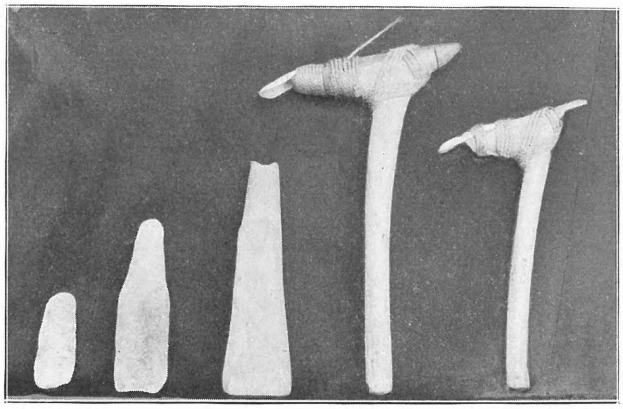

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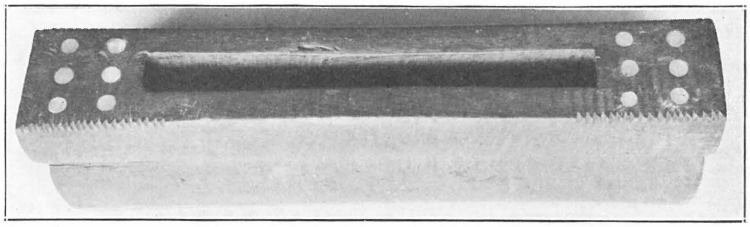
WEAPONS AND ADZES



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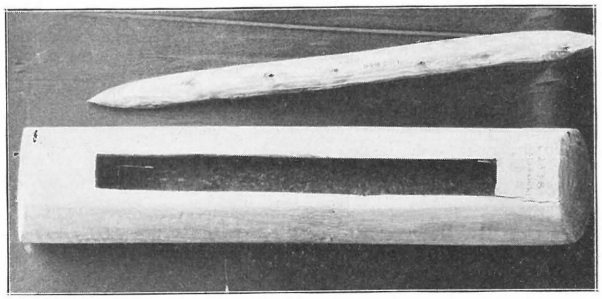

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WOODEN GONGS AND HISTORICAL PLAY